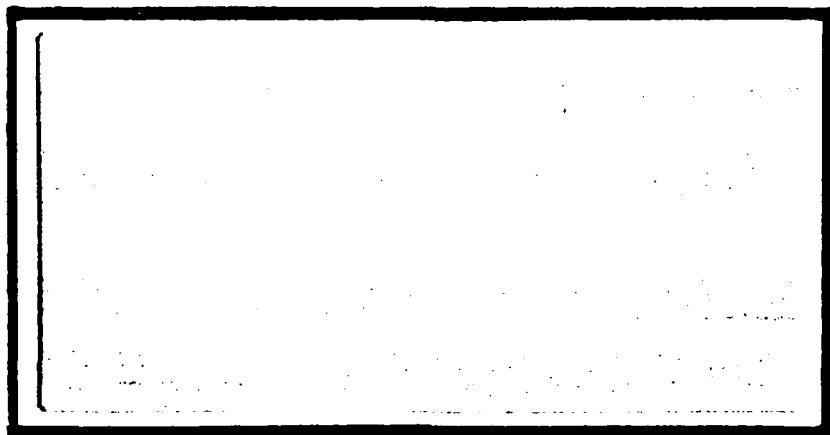


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CIVIL ENGINEERING COMBAT EXPERIENCES
DURING THE VIETNAM WAR:
AN EXPLORATORY STUDY

THESIS

Gary B. Lauson
Captain, USAF

AFIT/GEM/DEE/89S-11

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Preface

The objective of this research was to identify significant aspects of the combat experiences of Air Force Civil Engineering (CE) personnel in Vietnam. This was an exploratory study designed to describe the Vietnam combat experience in terms of factors identified by men who had served in Vietnam as well as major dimensions of combat behavior: leadership, cohesion and combat motivation. Tentative conclusions are offered on the worst problems faced by CE in Vietnam as well as how Civil Engineering personnel could have been better prepared for combat in Vietnam.

Several people were very helpful in accomplishing this study. First, my advisor, Captain Jon Wheeler helped me refine and develop the concept for this study. Also, Lieutenant Colonel John Ballard was a major player in developing the interview questionnaire. I am also deeply indebted to the Vietnam combat veterans who were so open in sharing a significant part of their lives with me. Without their cooperation and insights into the Vietnam combat environment, this research could not have been accomplished.

Finally, I thank my wife Sherry for her understanding and patience during this long year. Her careful editing made this final product far easier to read than would have otherwise been possible.

Gary B. Lauson

AFIT/GEM/DEE/89S-11

CIVIL ENGINEERING COMBAT EXPERIENCES
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THESIS

Presented to the Faculty of the School of Systems and Logistics
of the Air Force Institute of Technology
Air University
In Partial Fulfillment of the
Requirements for the Degree of
Master of Science in Engineering Management

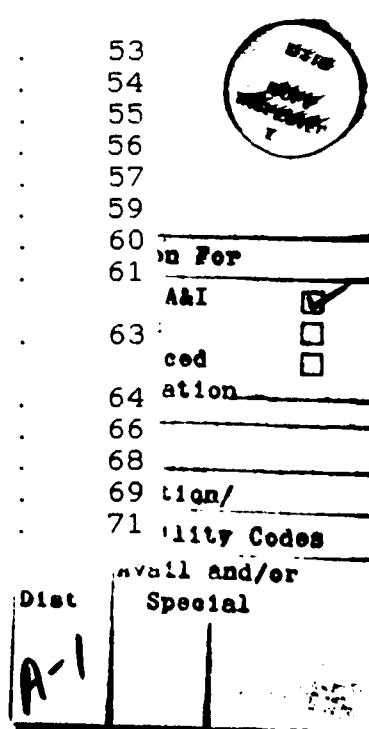
Gary B. Lauson
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September 1989

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Abstract

This thesis was an exploratory study designed to identify important aspects of the combat experiences of Air Force Civil Engineering (AFCE) personnel in Vietnam. A lack of previous research on Air Force ground combat experiences required the collection of original data. A 56-question structured questionnaire was used to interview seventeen AFCE Vietnam veterans about their combat experiences. Research results describe the Vietnam combat experience in terms of AFCE leadership, cohesion and combat motivation. Tentative conclusions are offered on the worst problems that were encountered (from a human element standpoint) by AFCE in Vietnam as well as how Civil Engineering personnel could have been better prepared for the combat they experienced. Recommendations are made for further research.

CIVIL ENGINEERING COMBAT EXPERIENCES
DURING THE VIETNAM WAR:
AN EXPLORATORY STUDY

I. Introduction

Overview

The most recent source of combat experience for U.S. military forces is the Vietnam War. In the seventeen years that have passed since the end of that war, the number of combat-experienced Air Force personnel has declined through retirement and separation. In 1988 approximately three quarters of the officers in the Air Force Civil Engineering (CE) career field had commission dates after 1972 (Torgerson, 1988:8). In spite of this loss of experience, many CE units today are reported as fully combat capable, ready to perform their wartime mission when the time comes. But the writings of great military thinkers cause one to question these ratings. For example, Carl Von Clausewitz, in On War, states that war is an environment characterized by "friction" where accomplishing even simple tasks is made very difficult (Jolles, 1950:53). Clausewitz believes

It is of immense importance that the soldier, high or low, whatever be his rank, should not see for the first time in war those phenomena of war which, when seen for the first time, astonish and perplex him. (Jolles, 1950:56)

And although in Clausewitz' opinion combat experience is the only lubricant for war's "friction", peacetime maneuvers

providing exposure to at least some elements of friction are more valuable than no exposure at all (Jolles, 1950:56).

Since it is the duty of the U.S. military to be prepared for war in all its forms, it would seem logical to believe the major factors involved in war have been anticipated and prepared for. But such is not the case. With the emphasis during the last thirty years on the application of cost/benefit analysis to military forces along with the depersonalization of an increasingly technical society, the U.S. military has been influenced to underemphasize the importance of the human element in combat (Johns, 1984:xii; Henderson, 1985:3; Kellett, 1982:336; Hauser, 1980:187). Because individual rights are given high consideration in the U.S., there is a tendency to let technology do the fighting (Ballard, 1989). As dependence on technology in the U.S. has grown, the importance of an unchanging element in battle has been obscured - man himself. Today, the success of military programs is often determined by measurable factors, even though the worth of a military instrument also depends on non-measurable factors like cohesion, leadership and willingness to fight (McDaniel, 1987:13; Creveld, 1982:3). Regardless of how weaponry has changed in recent times, combat remains, psychologically, an environment of "very old fashioned stresses and terrors" (Hauser, 1980:192). Marshal de Saxe concisely states the importance of man in combat:

The human heart is . . . the starting point in all matters pertaining to war. (Zais, 1985:58)

Some writers believe America's loss of the Vietnam War was brought about by ignoring human factors (Gabriel and Savage, 1978:31; Palmer, 1984:195). And, although in Vietnam Americans were not subjected to the large casualties or heavy bombardment of past wars, the forecast for future battlefields is incredibly destructive and psychologically terrifying (Lewy, 1980:94; Kishiyama, 1986:19; Phipps, 1982:1). The greater lethality of modern weapons has increased the rate at which casualties are inflicted compared with past wars: and this increased casualty rate brings with it a reduction in human ability to withstand battlefield stress (Keegan, 1976:325; Zais, 1985:60). Consequently, the human element may be of greater importance today than in wars of the past.

Due to the relative safety of air bases in Vietnam, the U.S. Air Force has had little experience in dealing with its bases being vulnerable to enemy attack. Consequently, Air Force doctrine currently does not recognize a need to provide Civil Engineering commanders with guidance on "organizational maintenance" which might encourage the development and maintenance of cohesion, leadership and motivation for combat (Kishiyama, 1986:19; Johns, 1984:39; Kellett, 1982:xvii). The lack of Air Force experience in these situations, however, does not remove the need to

prepare for them, particularly since the human element is often most decisive in combat.

Statement of Problem

Critical to the continuation of Air Force operations in time of war is the Civil Engineering mission of repairing war-damaged facilities (Smith, 1987:11). This mission requires CE personnel to be able to deploy on short notice and to operate in highly lethal environments (Ellis, 1986:3). And even though future wars are anticipated to be "come as you are" and will therefore not allow time for building cohesion into our units (Peters, 1986:8), the researcher has encountered many people in the career field who feel Air Force contingency training and efforts to promote bonding within Civil Engineering units are inadequate for this mission. A major reason for this situation is an overriding peacetime emphasis in the Air Force on operating and maintaining (O&M) base facilities (Cannan, 1988:12). Compounding the problem, these routine O&M activities bear little resemblance to assigned wartime taskings (Cannan, 1988:2). As a consequence, preparation for anticipated wartime activities is questionable. Considering the importance of the human element in war, the overall question motivating this research is what should the Air Force do to improve its preparation of Civil Engineering personnel for their wartime mission? If the Air Force does not consider the human side of combat now, unnecessary loss

of life may occur in future conflicts. Ardant du Picq's writings support this by stating:

. . . of nations apt in war, the strongest have been those who, not only best have understood the general conduct of war, but have taken human weakness into greatest account and have taken the best guarantees against it . . . The Roman, a politician above all . . . had no illusions. He took into account human weakness and discovered the legion. (Zais, 1985:63)

Research Objectives

This exploratory study had two objectives: (1) to identify significant aspects of combat experienced by Air Force Civil Engineering personnel in Vietnam; and (2) to identify questions which future research should consider in determining how to better prepare CE personnel for combat.

Investigative Questions

To achieve its purpose, this study sought answers to the following questions:

1. What kinds of ground combat situations did Air Force engineers encounter in Vietnam?
2. What are the major behavioral factors which influence effectiveness in ground combat?
3. What major problems did Civil Engineering personnel encounter in the Vietnam combat zone?
4. During the Vietnam War, how could the Air Force have better prepared Civil Engineering personnel for combat?

Scope and Limitations

This study was designed to identify factors that affected the combat experiences of Air Force Civil Engineering personnel in Vietnam. Because there was no data or previous research available in this area, first hand information was required. As an exploratory study, cases were sought which would provide special insight into what combat was like for CE personnel (Emory, 1985:63). Consequently, a representative random sample was not required. Results from this study were intended to provide a starting point for a future, methodologically stronger, research project on how the Air Force should prepare Civil Engineering (and other combat support) personnel for combat environments.

This study also formed part of two programs of on-going research in combat behavior conducted by Lieutenant Colonel John Baillard and Captain Jon Wheeler at the Air Force Institute of Technology. Experience interviews were conducted with officer and enlisted combat veterans who served as Civil Engineering personnel in Vietnam. Time periods, locations in country, and types of units served in were not limited by the researcher in this study.

Time constraints limited this study to a review of the literature and interviews with seventeen CE Vietnam combat veterans in the continental United States. And, due to difficulties encountered in locating Civil Engineering personnel with Prime BEEF team experience in Vietnam, this study is limited to the combat experiences of personnel who

were assigned to RED HORSE and Base Civil Engineering (BCE) organizations in Vietnam.

Report Organization

This chapter presented an overview of the need for more emphasis on the human element in preparing Civil Engineering personnel for their wartime mission. It also presented the research problem, investigative questions, and the research objectives. Chapter II reviews the literature on Civil Engineering's role in the Vietnam War, as well as important aspects of human behavior in combat. Chapter III presents the methodology used in this research. Chapter IV presents the results of the research method, that is the answers respondents provided during interviews. Chapter V is a discussion of the information contained in Chapters II and IV. Chapter VI presents the study's conclusions and recommendations.

II. Literature Review

In this chapter the literature is reviewed to provide the background and theory needed to accomplish the research objectives. This chapter consists of two parts. The first part describes the Vietnam War and combat zone, with emphasis on Civil Engineering's missions, accomplishments and problems. The second part of the review describes the major dimensions of human behavior in combat in order to provide a basis for discussing data obtained from interviews with Civil Engineering (CE) Vietnam combat veterans.

Background

This section begins with a brief history of U.S. involvement in the Vietnam War, with emphasis on describing the nature of war. Following this history is a description of the missions, problems and accomplishments of the three most typical units in which Civil Engineering personnel were deployed to Vietnam: Base Civil Engineering, Prime BEEF, and RED HORSE.

The Vietnam War. On 30 April 1975, twenty five years from the date President Truman approved the start of U.S. military aid to Indochina, the South Vietnamese government fell to North Vietnam's communist regime. Thus ended America's longest conflict (Palmer, 1984:vii).

U.S. problems in Vietnam actually started in the concluding months of World War II with some allies

increasing attention on the future of their colonial territories. For France, one of these territories was Vietnam (Palmer, 1984:3; Waggoner, 1985:200). After the war, France sought to restore her overseas empire by bringing Indochina back under her control. However, the opposition of the Viet Minh (the Communist-led nationalist movement) became a major roadblock to this (Williams and others, 1985:47). To deter a perceived Chinese Communist movement into Southeast Asia and in keeping with its policy of containing Soviet and Chinese communism, in May 1950 President Truman decided to aid the French in maintaining their hold in Indochina (Karnow, 1983:43; Summers, 1983:98). In September 1950, the U.S. established a small military assistance and advisory group (MAAG) in Saigon with the objective of developing a conventional army with which South Vietnam could defend itself from external attack (Palmer, 1984:6). Under this arrangement, the French provided military training and performed combat operations while the U.S. provided logistic support. Due to increased military aid from China to North Vietnam, in November 1950, the French lost their outposts on the Chinese border. The loss of these outposts allowed the establishment of Vietnamese bases and opened routes for major aid from China to northeastern Vietnam. These factors produced a significant change in the nature of the war between North and South Vietnam because Viet Minh forces could now escalate in response to any Western force expansion in Vietnam or Laos (Palmer, 1984:5).

Even with the United States supplying nearly 75% of the war's cost in 1954, the French suffered frequent military defeats that began to erode their will to fight. (Palmer, 1984:6). It also became clear that American and French objectives in Vietnam could not coexist; the French sought to maintain their empire in Vietnam while the US pressed for a pro-West, independent government (Palmer, 1984:7). France saw the futility of its colonial efforts in Vietnam when South Vietnam proclaimed itself a Republic with its own presidency in October 1955, and withdrew all troops and army advisers by April 1956. However, because France had vigorously suppressed Vietnamese efforts at leadership and self government, their withdrawal produced an enormous political, military, and psychological void in South Vietnam. This became a major obstacle for the U.S. objective of an independent South Vietnam with a strong military (Palmer, 1984:7,8). In hindsight, U.S. intervention in Southeast Asia (SEA) was rash because of a lack of understanding that existed concerning Chinese-Soviet-North Vietnamese relations. Many writers of U.S. history feel the U.S. did not have clear objectives at any time during the Vietnam War (Summers, 1982:98; Palmer, 1984:7,8). History also shows the U.S. severely underestimated the tenacity of the North Vietnamese and mistakenly ascribed American values to them (Karnow, 1983:18).

The U.S. took over in Vietnam from France in 1956 with the objective of curbing communist aggression in South East

Asia. Chinese aggression was particularly feared. However, U.S. objectives changed twice before the end of the war: in 1962 the emphasis shifted to counterinsurgency; and in 1968 the dominant theme became keeping American commitments. In contrast, the North Vietnamese always had one clear objective: to install a Communist regime throughout Vietnam, Cambodia and Laos (Summers, 1983:98).

Prior to 1964, U.S. involvement in Vietnam primarily entailed providing military advisors, technical guidance, and facilities to aid the host countries (Waggoner, 1985:202).

President Kennedy's shift in strategic defense policy to one of flexible response placed a new emphasis on being prepared for any level of conflict, from counterinsurgency to nuclear warfare. This policy shift resulted in a large expansion of the American presence in Vietnam. The number of military advisors increased from 900 in January 1961 to nearly 17,000 toward the end of 1963 (Schlight, 1988:3; Palmer, 1984:10).

Increased U.S. military contingency actions in 1964 provoked the Tonkin Gulf incident and a worsening of the political and military situation in Vietnam (Waggoner, 1985:205). Increasingly persistent and vigorous Viet Cong attacks on U.S. aircraft, facilities, and personnel prompted the President to send the first American combat troops to Da Nang in March 1965 (Karnow, 1983:412,415,416; Palmer, 1984:35).

A steady build-up of U.S. forces was soon underway that peaked in 1969. Table 1 shows the build-up from 1960 through 1972 with total U.S. military personnel in Vietnam exceeding 540,000 in 1969 (Waggoner, 1985:204).

The Air Force had two general roles in supporting a limited war against insurgency in SEA: airlift of supplies and personnel, and providing close air support to troops on the ground. Between 1961 and 1973, the Air Force provided this support in a wide variety of arenas: strategic bombing, reconnaissance and interdiction over North Vietnam; airlift, close air support, reconnaissance, air defense and interdiction in South Vietnam; and reconnaissance and interdiction against the trails in southern Laos (Schlight, 1988:iii, iv, v). Civil Engineering was deployed to Vietnam and Thailand to support this capability.

U.S. military involvement decreased during the period from 1969 to 1975 because of public dissatisfaction with rising casualties, increased taxes, and the apparent lack of a solution; all of which pressured America's political leaders to settle the conflict (Karnow, 1983:19,20). The withdrawal of U.S. combat troops was complete in August 1972, with about 40,000 Americans remaining in support positions (Palmer, 1984:121). The last Americans, selected foreign nationals, and thousands of South Vietnamese had left the country for good on 30 April, 1975 (Palmer, 1984:150; Waggoner, 1985:205).

Table 1
U.S. Military Personnel in Southeast Asia *

<u>Year</u>	<u>Total</u>
1960	900
1962	11,300
1964	23,300
1965	184,300
1966	485,300
1967	485,600
1968	536,100
Jan 1969	542,400
Dec 1969	474,400
1970	335,800
1971	250,900
1972	40,000

* From Waggoner (1985:204)

Nature of the Conflict. The Americans and South Vietnamese did not fully understand Viet Cong tactics and force structure, particularly during the middle 1950s to early 1960s. Conditioned by the massive Chinese intervention during the Korean War, U.S. leaders initially considered the main threat to be invasion by the North Vietnamese or Chinese forces. Even after recognizing the actual threats to be infiltration, subversion and guerrilla warfare, the U.S. did not send adequate counter forces until 1964 (Palmer, 1984:5,9). During this period of misunderstanding, the Viet Cong established a military base system and political organization in South Vietnam with the goal of subverting the government "through exhaustion and internal collapse" (Palmer, 1984:12; Karnow, 1983:423). Consumed by a nearly fanatical dedication to unify Vietnam under

communist control, the Viet Cong experienced and accepted enormous casualties (Karnow, 1983:17).

The Vietnam War differed from previous wars fought by Americans because there was no front line. Consequently, progress toward the war's end was not evident. And because the enemy and local citizens looked and dressed alike, U.S. servicemen could be wounded or killed anywhere - in the cities or in the country (Karnow, 1983:434; Moskos, 1975:29). Americans didn't know who the enemy was and who to trust (Karnow, 1983:467).

Base Civil Engineering In Vietnam. The objective of this section is to provide insight on what daily life was like for personnel assigned to Base Civil Engineering (BCE) squadrons in Vietnam. Later sections will address Prime BEEF and RED HORSE experiences in Vietnam.

Air Force Civil Engineering involvement in SEA began in late 1961 with the increase in U.S. military advisors sent to South Vietnam. The increased advisory role generated increased facility requirements. Consequently, Civil Engineering personnel were sent in a temporary duty status to construct tent camps, interim support facilities and to provide facility operations and maintenance support (Ashdown, 1984:44). Like other Air Force requirements, Civil Engineering support later greatly escalated. For the remainder of this review of the Vietnam War the focus will be on the most active period of the Conflict - the heavy

buildup following the Gulf of Tonkin incident of August 1964 (Hamilton, 1968:14; Bartholomew, 1970:9).

Generally, BCE responsibilities in Vietnam were to provide new Air Force facilities, operate and maintain existing USAF facilities, operate and maintain base utility systems, and to provide base fire protection. This mission was basically the same as the BCE mission in the United States (Engelbach, 1965:2; Hamilton, 1968:15; Lau, 1968:10). Civil Engineering functional areas were fairly standardized in Vietnam; with the main differences among bases being size and complexity (Mayes, 1967:3).

Following is a description of typical Operations and Maintenance (O&M) responsibilities and problems which BCEs regularly faced in Vietnam. At the end of his tour as Director of Civil Engineering in Vietnam, Colonel Mayes stated that problems in the O&M area were caused by two things: the lack of established manpower requirements which should have considered factors such as base population, number and type of assigned aircraft, number and type of existing facilities, and the physical and geographic characteristics of the base itself; and (2) an inadequate supply system (Mayes, 1967:3; Waggoner, 1985:205). A third common problem was insufficient utilities support. The following discussion will center on these three problem areas (Waggoner, 1985:205).

There were seventeen BCE organizations in Vietnam. Prior to the build-up, these were small detachments or

squads (Hamilton, 1968:14; Waggoner, 1985:206). As U.S. involvement accelerated, BCEs were faced with the enormous task of rehabilitating and enlarging existing French and Japanese airfields to meet operational requirements (Torr, 1964:68). The fact that Civil Engineering in SEA was organized to perform facility maintenance rather than provide new facilities created problems (Corona, 1970:321). In addition to base rehabilitation, increased numbers of flying missions further taxed the Civil Engineering organizational resources (Waggoner, 1985:206). One of the largest requirements for Civil Engineering was providing air conditioning. The hot, humid, austere climate of SEA made air conditioning much sought after not only for personal comfort, but also as a mission necessity for navigational and communication facilities (Corona, 1970:282).

During the build-up these small CE contingents were obviously undermanned and assignment of additional personnel always lagged increased duties. Unsatisfied personnel requirements were filled on a temporary duty (TDY) basis (Waggoner, 1985:206). However, by mid-1966, the problem of personnel shortages was solved, though occasionally TDY personnel were needed for backlogged work (Corona, 1970:104).

In addition to problems with manpower shortages, BCEs were limited by: (1) unskilled and untrained craftsmen (due to being trained in replacement rather than repair or having too little trade experience); (2) a lack of supervisory

capability (due to subordination to civilian supervisors); and (3) problems in dealing with local national employees (shortages of skilled local craftsmen, communication problems, unfamiliarity with U.S. trade practices). Also, on most installations local nationals grossly outnumbered U.S. military personnel. Because of the time required to achieve full capability for much of the work force, the 12-month tour in Vietnam routinely subjected BCEs to partially capable workforces (Waggoner, 1985:207-209). BCE's relied heavily on local labor in constructing living quarters for incoming personnel. These quarters were by no means standard. They were hardback tents, "hootches", "Bien Hoa" huts, or whatever type of temporary structure that could be built quickly by mass production with the skills available (Ashdown, 1984:47).

In nearly every aspect of daily operations. Civil Engineering personnel had to contend with problems that were foreign to bases in the United States. Particularly acute was the weather which basically has two seasons: six months hot-wet and six months hot-dry. The resultant climate effects on soil conditions during the wet months presented construction problems that could not be permanently overcome because of a lack of specialized, extremely expensive equipment. Construction problems also arose from the country's mountainous terrain, lack of skilled labor, and the constant threat of surprise attack (Torr, 1964:64).

Two other specific problems were: (1) the inadequate supply and frequent poor quality of received materials; and (2) difficulties in providing utilities. Logistics in Vietnam was primarily a "push" system which provided tons of un requisitioned material which had to be distributed by an undermanned supply force and limited transportation system. Ships sometimes waited for weeks in port to be off-loaded and supplies sat on the coast waiting for transportation (Waggoner, 1985:210-211; Mayes, 1967:2).

Utility problems involved the supply and distribution of power and the supply of potable water and sanitation. Local commercial sources of power could not meet the tremendous power requirements. Also, the 50-cycle power provided by Vietnamese power plants was largely incompatible with U.S. 60-cycle equipment. Consequently, Air Force facilities and equipment often relied on portable generators (with high break down rates and parts that were hard to obtain) (Torr, 1964:71; Waggoner, 1985:212). Another persistent problem was the supply, storage and treating of water. Since it was dangerous to rely on distant sources of water (due to ambush and sabotage), on-base wells supplied water on most installations. The average cost of a U.S. well in Vietnam was \$15,000 and in 1968 there were over 300 of them. A secure source of potable water was important because serious base-wide casualties could occur through waterborne contamination (Lau, 1968:10; Waggoner, 1985:214-215).

Although there were other problems with which Civil Engineering had to contend in SEA, those concerning manpower, supply, electrical power and potable water were the greatest (Waggoner, 1985:215).

Other challenges that the BCE's faced included ever-changing and ever-increasing power requirements, water shortages in the dry season and floods during the monsoons, sanitation hazards, maintenance of arresting barrier systems, daily flightline emergencies requiring rapid response by crash/rescue crews, and increased maintenance requirements caused by the environment and the temporary construction (Ashdown, 1984:47).

Prime BEEF In Vietnam. In 1963 because the Air Force was concerned about Civil Engineering's ability to fulfill its combat support role, a joint "Civil Engineering, Manpower, and Organization Study Group" was formed to recommend an alignment and distribution of skills which would enable Civil Engineering to perform its wartime role. The identified changes were incorporated into an Air Force-wide program called "Prime BEEF" which was designed to structure Civil Engineering units around a "disaster recovery team concept" (Meredith, 1964:2; Stehling, 1967:3). Under Prime BEEF, Civil Engineering's military personnel were to be trained and organized to recover from short-term natural disasters and enemy attacks as well as to perform daily operations and maintenance activities (Meredith, 1964:2; Stehling, 1967:4).

Following the Gulf of Tonkin incident, large numbers of Air Force tactical aircraft were deployed to SEA. During this buildup, undermanned BCEs were inundated by constantly changing mission requirements and by an environment in which every task was critical. Requirements for new bases and the expansion of existing ones created excessive workloads for BCEs along with frustrations from growing backlogs of work (Canton, 1967:5; Waggoner, 1985:220; Corona, 1970:112). Because projects could not be completed on time by BCE or by in-country contractor forces aircraft had to be parked close together and without protection from enemy attack (Kaufman and others, 1966:3; Arnold, 1966:7). As a direct result, in May 1965, 40 B-57 aircraft were destroyed and 26 Americans were killed on the Bien Hoa AB ramp when a bomb exploded on an aircraft wing (Waggoner, 1985:221). It was obvious that protective aircraft facilities were badly needed but the construction resources Air Force planners had counted on were not available (Corona, 1970:252). So, in July 1965 HQ USAF tasked three Major Air Commands to each provide one Prime BEEF team to construct revetments (Canton, 1966:3; Stehling, 1967:5; Ashdown, 1984:48).

The majority of personnel on these first three Prime BEEF teams (referred to as "Prime BEEF I") were hand-picked to ensure mission success (Waggoner, 1985:222). As the war progressed, Prime BEEF team members were not selectively chosen, not only because many of the first team members had already fulfilled their 12-month commitment, but also

because the Air Force wanted to broaden its base of war-experienced personnel. Prime BEEF I teams arrived at Tan Son Nhut on 8 August, 1965, with two of the units deploying from there to Da Nang and Bien Hoa air bases (Ashdown, 1984:49). This group of three teams succeeded not only in performing its assigned tasks, but more importantly, in validating the need for an Air Force mobile warfighting capability. By 1968, 50 Prime BEEF teams, using approximately 1400 AFCE military personnel, had supported the Air Force mission at 16 bases in SEA (Corona, 1968:38). Most of these teams were tailored to mission requirements, specializing, for example, in plumbing, electrical work, and POL site development. Other teams provided general construction support (Stehling, 1967:6; Ashdown, 1984:50,51). Table 2 shows the diversity and magnitude of Prime BEEF accomplishments in Vietnam (Ashdown, 1984:52; Canton, 1967:5).

Training for the first three Prime BEEF teams was conducted at Eglin AFB and consisted of briefings for the officers and key NCOs on their mission and contingency construction methods. All team members received M-16 training (Kaufman and others, 1966:4). However, as late as 1969, the only combat training provided was the care and operation of the M-16 rifle. The bulk of the training in 1969 involved the operation of heavy equipment, erection of contingency structures, and the operation of water purification units (AFTIMES, 1969:31).

During the war, Prime BEEF teams were deployed on a TDY basis for 120 days (Corona, 1970:241). This TDY time counted toward a person's total time in Vietnam (tours were limited to 12 months unless one voluntarily extended), although some specialties were required to serve more than 12 months because of career field shortages (Corona, 1970:103). Because these teams deployed to established air bases with only their handcarried tools, they had to rely on BCE resources and were subject to the same problems that BCE organizations faced: material shortages,

Table 2

Prime BEEF Accomplishments August 1965 - January 1967 *

Revetments	27,000 LF	Grubbing/Grading	8.5 Acres
Revetment Fill	53,000 CY	Drainage Ditches	1.400 LF
Blast Deflectors	9,300 SY	Sanitary Sewers	1,800 LF
Buildings	220,000 SF	Water Mains	19,000 LF
Concrete Ramps	3,700 SF	Tent Frames	44,000 SF
Concrete Shoulders	2,700 SY	Hi Intensity Ltg Sys	1 EA
PSP Removal	14,400 SY	Runway Lighting	1,200 LF
Matting Placed	55,600 SY	Elect Svc Drops	45 Bldgs
Modular Hospital	16,000 SF	Elect Distribtn	7,100 LF

* From Canton (1967:5)

equipment breakdowns and a lack of tools (Corona, 1970:242; Waggoner, 1985:225). Prime BEEF duties often involved augmenting local BCE forces in reducing backlogs on construction and maintenance work (Kaufman and others, 1966:5; Corona, 1970:309). However, because of the critical nature of the work for which Prime BEEF was tasked, most BCEs gave

Prime BEEF priority in the use of resources (Waggoner, 1985:220). Although deployed for only four months, Prime BEEF teams accomplished tremendous amounts of work on a variety of projects. Overall, esprit, eagerness and morale were at a high level in all the teams. "Prime BEEF teams received the praise of all who observed their work" (Corona, 1970:242).

RED HORSE In Vietnam. Following the Tonkin Gulf incident, Prime BEEF teams were used to

"plug holes in the dike" until a greater construction contract effort could be programmed, funded, mobilized and put to work. (Stehling, 1967:6)

However, it soon became apparent that Air Force combat units could not wait for the fully taxed Army and contract construction resources to meet its growing minor construction and heavy maintenance/repair requirements (Stehling, 1967:6,10,11; Curtin, 1966:1). During the Korean War a state of National Emergency had been declared allowing the Army to provide heavy repair support to the Air Force. The Vietnam War, however, was fought under a Presidential Executive Order which did not permit Army Reserve forces to be mobilized. And since Army construction forces allocated for Air Force requirements were in the Reserves, Army support was inadequate (Wheeler, 1987:29,30; Waggoner, 1985:221). Consequently, there was no way to accomplish the major repairs required for the Vietnamese airfields, nor was there a means to rapidly repair major damage or destruction

caused by attacks on Vietnamese air bases (Stehling, 1967:7; Curtin, 1966:1).

In August 1965 HQ Pacific Air Forces (PACAF) requested emergency construction and heavy repair capability and HQ USAF acted on the request by creating RED HORSE (Rapid Engineering Deployable Heavy Operation Repair Squadron, Engineer). In October of 1965, two RED HORSE squadrons were activated and sent to Cannon AFB, New Mexico for training. In February 1966 these squadrons (designated 554th and 555th CES (HR) were deployed, respectively, to Phan Rang and Cam Ranh Bay, two new Vietnamese bases under construction for the Air Force (Stehling, 1967:8,9). These squadrons consisted of 400 men (388 enlisted, 12 officer) and had their own heavy construction equipment and supplies. And because RED HORSE units were designed to be self-sufficient combat units, they included vehicle maintenance, medical, food service, and supply specialties to ensure their effectiveness (Smith, 1987:10).

The main goal of Air Force leadership in the RED HORSE program was to provide the Air Force a mobile capability to perform heavy repair, emergency minor construction, and airfield facility upgrades under combat conditions. These units were not intended to substitute for Army troop construction, but would fill a gap in needed construction capability while waiting for Army troop construction support. In fact, the Air Force originally had planned to disband RED HORSE units following completion of operations

in SEA (as happened with aviation engineering units after World War II) (Hartzer, 1989). Also, RED HORSE would allow BCE squadrons to concentrate on their primary job of daily facility operations and maintenance, and would reduce the need for Prime BEEF deployments to SEA (Curtin, 1966:1; Stehling, 1967:8; Ashdown, 1984:53).

A total of six RED HORSE squadrons were deployed to SEA: (1) 554 CES - Phan Rang, then Cam Ranh Bay, then Da Nang; (2) 555 CES - Cam Ranh Bay; (3) 556 CES - U-Tapao, Thailand; (4) 819 CES - Phu Cat, then Tuy Hoa; (5) 820 CES - Tuy Hoa, then Da Nang; (6) 823 CES - Bien Hoa (Waggoner, 1985:243).

Although RED HORSE units were smaller than Army construction brigades and Navy SEABEE units, as shown in the following list, they possessed significant capabilities (Waggoner, 1985:242):

1. Expedient airfield bomb damage repair
2. Construction of expedient airfields
3. Cantonment area construction
4. Limited POL support, e.g., above-ground fuel bladders
5. Operate for at least 90 days without base support
6. Aircraft arresting barrier installation
7. Analysis of soil and terrain
8. Expedient airfield construction
9. Field maintenance of construction equipment
10. Shallow well construction (less than 250 feet deep)

11. Asphalt work

12. Ability to redeploy in "blocks" of required skills

The tremendous construction capabilities of RED HORSE squadrons were augmented through the use and training of local national civilians. The number of local nationals in Vietnam ranged from 500 to 1000 per squadron (Corona, 1970:249).

Training for the first two RED HORSE units involved familiarization with construction equipment and minor training in warfighting skills. Starting in November 1966, units received the benefit of more in-depth training given by the Civil Engineering Field Activities Center (CEFAC). This training was a mandatory 60-day TDY for RED HORSE personnel, and was given enroute overseas. Practice was provided on the same type of heavy equipment as was used overseas as well as a variety of combat training, which included throwing handgrenades, use of the 40 MM grenade launcher, hand-to-hand combat tactics, simulated attacks on convoys and fire squad tactics (Dimitroff, 1967:6,7).

Morale was far easier to sustain in RED HORSE squadrons than it was in Base Civil Engineering squadrons, because as a new concept, RED HORSE received a lot of attention and publicity. The success and magnitude of its accomplishments made RED HORSE a star. Having their own medics and food service personnel also had a tendency to increase RED HORSE morale, often at the expense of the morale of BCE personnel.

In fact, many RED HORSE personnel extended their tours in SEA (Corona, 1970:111, 104).

An example of the rugged capabilities RED HORSE possessed in SEA was occasioned by the torrential rains that struck Phan Rang AB in May 1966. The saturation and consequent weakening of the airstrip subbase was so extensive that the 554th CES had to repair or reconstruct nearly the entire airfield (2,000,000 square feet), a task which required excavation to depths of up to eight feet. By working at night, RED HORSE precluded interruption of the base flying schedule with the result that not one operational mission was lost (Stehling, 1967:10; Ashdown, 1984:56). Because cost escalations reduced the value of Air Force construction dollars RED HORSE was also used to assist in-country contractors constructing Air Force facilities (a role not originally intended). The most significant example of this occurred with the construction of an entire air base at Tuy Hoa, where RED HORSE accomplished about 50 percent of the \$50 million project (Wheeler, 1987:39; Waggoner, 1985:243; Canton, 1966:3).

The problems RED HORSE squadrons encountered were similar to those encountered by BCEs. The worst problem areas were construction material availability and equipment maintenance (Corona, 1970:248). A Corona Harvest report commented on material availability problems:

The eventual solution was developed in the PACER OAR Program where a bill of materials (for approved construction projects) was compiled in the CONUS and the

materials shipped to SEA. The entire shipment was developed, monitored and used by the RED HORSE Squadrons. (Corona, 1970:249)

To deal with equipment and vehicle problems, RED HORSE squadrons were manned with some of the world's best equipment maintenance mechanics. Tools and maintenance equipment were considered adequate. The most significant contributors to inoperable equipment was a lack of in-country "spares and component assemblies". Many times simple items such as filters and tires were the most difficult to obtain (Corona, 1970:249, 250).

RED HORSE squadrons were involved in the construction of every type of facility in Vietnam. They were recognized as extremely successful and proved the Air Force could organize and sustain its own troop construction capability (Waggoner, 1985:243, 244). And in spite of the United States' failure to obtain its objectives in SEA, Civil Engineering gained tremendous capabilities and experience while over there.

Major Dimensions of Combat Behavior

The purpose of this part of the literature search is to describe the major dimensions of human behavior which leading authorities consider important to effectiveness in combat. For each dimension, an explanation of its importance is given along with a brief description of how it works. Because so much of the ground combat literature is written from an army perspective, frequent use of the term

"soldier" in referring to combat participants serves to preserve the intent of source writings. Also used in this study is the term "combat behavior" which refers to:

individual and group behavior occurring in a combat environment -- an environment in which hostilities have occurred, are occurring, or in which individuals perceive that hostilities are probable. (Ballard, 1988:200)

The following major dimensions of behavior in combat were found in the literature: (1) combat motivation, (2) cohesion, (3) morale, and (4) leadership (Waller, 1982; Toole, 1988). Although these dimensions do not cover every factor which affects human behavior and effectiveness in combat the researcher believed a review of the broad areas would provide a sufficient background to accomplish exploratory research objectives.

Combat Motivation. The first major dimension of combat behavior is combat motivation, or the willingness to fight.

Kellett defines combat motivation as:

the conscious or unconscious calculation by the combat soldier of the material and spiritual benefits and costs likely to be attached to various courses of action arising from his assigned combat tasks. Hence motivation comprises the influences that bear on a soldier's choice of, degree of commitment to, and persistence in effecting, a certain course of action. (1982:6)

The subject of why men endure the rigors of combat is "as complex as human behavior itself", and is characterized by many different theories (Hauser, 1980:195; Moskos, 1975:25). It is an intriguing subject because of the very nature of combat: the constant tension, the fear of death and injury.

the loss of friends, and the sight of the injured and the dying (Grinker and Spiegel, 1945:37,38).

Because there is no such thing as a "typical" soldier, it would be incorrect to assume a single, absolute reason for why men fight (Kellett, 1982:319). As a result, many writers assert that performance in combat results from a complex interaction between individual motivation and the specific situation (Kellett, 1982:331,336; Henderson, 1985:78). Studies during World War II reveal there is no motivation strong enough to sustain the average soldier in stress of combat indefinitely (1949:191).

Lieutenant Colonel Ballard of the Air Force Institute of Technology has developed a framework to classify the many theories that have been advanced to explain why men fight. This framework will be used to describe these different theories. In his review of the combat motivation literature Ballard identified seven motivations for continued participation in combat. In fact, the other three major dimensions of combat behavior can also be classified into this framework. However, because these dimensions occur in the literature so frequently, and provide a number of important insights, they will be reviewed as typically found in the literature.

Primary Groups. The first theory of combat motivation, called the Primary Group Theory arose largely from studies accomplished during World War II. This theory attributes willingness to fight to involvement with a few

close fighting companions (Moskos, 1975:26). These close friendships develop through continual face-to-face interaction brought about by environments characterized by shared stress, deprivation, and the need for psychological comfort. (Wesbrook, 1980:251; Moskos, 1975:26). Values formed from association with these groups can be so intense as to override previous civilian values and even an individual's sense of self-preservation (Moskos, 1975:27).

The feelings of loneliness, isolation and helplessness characteristic of the modern battlefield are major reasons primary groups form. Many writers assert that in modern war, with the exception of two or three close companions, the soldier is alone on the battlefield (Henderson, 1985:5; Kellett, 1982:98). The reason for this is that modern weapons are more destructive than those of the past; and require dispersal of military forces, thereby increasing the perception of isolation (Zais, 1985:59). Close comrades help each other overcome feelings of helplessness and loneliness by providing: (1) the need to maintain an appearance of control in the eyes of others, and (2) feelings of physical protection and confidence. These factors encourage soldiers to believe that threatening situations can be overcome (Keilett, 1982:98,320; Solazzo, 1968:45).

Primary groups were studied extensively in World War II, and were found to be the main "social units through which values and ideals are imparted and social control exercised" (Johns and others, 1984:6; Kellett, 1982:320).

The phrase "I can't let my buddies down" describes the nature of the internalized loyalty in these groups (Ballard, 1989). Standards of social conduct are upheld through the distribution or withholding of approval, recognition, and respect (Williams and Smith, 1949:131). And although not all social scientists accept primary groups as the main determinant of combat performance (Johns and others, 1984:2), it is generally agreed they sustain "the individual in stresses he would otherwise not have been able to withstand" (Williams and Smith, 1949:130). Primary groups sustain soldiers in combat by performing the following important functions (Ballard, 1989):

1. Provide support in moments of weakness
2. Meet basic needs for love, help, friendship
3. Provide group norms
4. Provide group surveillance and reporting

Primary groups also encourage individual self control. This has become more important than coercive discipline which was used prior to World War I to prevent defection in battle (Kellett, 1982:133). In modern war there is a greater reliance on soldier self control partly because commanders do not have the direct control over troop movements they did in past wars (Henderson, 1985:5). Primary groups are considered to be important in combat because of the incentives they provide soldiers to exercise self control. From the individual's perspective, a main feature

of primary groups is not letting one's fighting comrades down. Four important reasons for this are (Ballard, 1989):

1. Fear of others letting the individual down
2. Fear of losing status in the group
3. The power of group norms
4. Bonds created through friendship

Shils and Janowitz concluded that German soldiers were sustained in World War II by membership and acceptance in primary groups. The individual's performance in combat was seen as closely related to the group's ability to meet the soldier's needs for esteem and affection, physical sustenance, exemplary leadership, and regulation of relations with authority (1975:178,181). Shils and Janowitz believed the following factors weakened group solidarity: failure to become part of a primary group; men who had difficulty receiving and giving affection; the recollection of family ties; and concern about food and health (Shils and Janowitz, 1975:183,186,189; Kellett, 1982:100).

Bonds With The Military Unit. The second theory of combat motivation emphasizes the soldier's inclination to bond with the formal military organization as a motivation to fight (Ballard, 1989; Wesbrook, 1980:252; Moskos, 1975:26; Smith, 1949:142). This bonding has historically been referred to as "morale", "regimental spirit", "esprit de corps", and more recently, "unit cohesion" (Wesbrook, 1980:252; Kellett, 1982). Leadership is an important

influence on this formal bonding and is discussed in a later section (Ballard, 1989).

Bonding with the unit is manifested in two ways: (1) pride in unit accomplishments, with accompanying feelings of responsibility to not let the unit down; and (2) a sense of home or community throughout the unit, where a member's commitment to the unit drives him or her to seek status through fulfillment of demands made by the unit (Wesbrook, 1980:253).

Bonding with the unit is important for several reasons. First, because of the power of group norms, men who know and trust those they are fighting with are more likely to continue fighting than they are to desert (Hauser, 1980:190,191; Smith, 1949:142).

Strong identification with a formal unit is based on feelings of trust in the reliability of others in the unit. Units in which members are not familiar with each other cannot provide this feeling of security (Smith, 1949:143). Also, primary groups are apt to comply more with military goals where there is a strong feeling of loyalty and pride in the unit (Kellett, 1982:321).

Second, feelings of power and security are conferred on individual soldiers who are aware of the successful and heroic performances of those previously in the unit. This knowledge imparts confidence through feelings of belonging to a successful and powerful group (Wesbrook, 1980:253). Finally, because in combat, the fear of being wounded is pervasive, men look for assurance that

• others will take the necessary trouble of caring for them should they be wounded. In World War II, one source of this assurance was the trust and dependability established in a unit that had been successful in combat (Smith, 1949:144).

Just as with primary groups, the creation of unit bonding requires time, shared hardships and experiences, and is affected by many of the same factors - interpersonal attraction, normative integration, etc. (Hauser, 1980:190; Wesbrook, 1980:252). This is because attachment to formal organizations is based in emotion rather than in logic (Hauser, 1980:192). In primary groups, the need for mutual dependence on other members is clear and happens naturally, whereas perception of the relationship of unit bonding to success in combat often requires extensive formal communication as well as exposure to combat (Wesbrook, 1980:252). In combat, groups attach the most importance to the organizational level which meets the majority of their needs (Wesbrook 1980:252).

Ideology. A third theory of combat motivation involves the soldier's ideological beliefs (Wesbrook, 1980:253; Moskos, 1975:26; Williams and Smith, 1949:156).

Ideology is defined as

a shared set of values, beliefs, and practices concerned with social and political life that define what is right and proper. (Wesbrook, 1980:254)

From an organizational behavior standpoint, beliefs and attitudes form ideology, from which come a person's intentions and actual behaviors (Ballard, 1989). In the ideology

theory, combat motivation and performance depends on the soldier's commitment to society's values, symbols, and stated purposes for the war. Such commitment are assumed to exist before entry into combat (Moskos, 1975:26).

Soldiers who are motivated by ideology have been found to be less susceptible to demoralization and better prepared for extended combat than those without ideological beliefs (Kellett, 1982:327; Wesbrook, 1980:253). In past wars, soldiers with strong ideological motivations provided role models for weaker men and thereby hindered the spread of demoralization (Shils and Janowitz, 1948:184). Conversely, according to studies done in World War II, effective soldiers are not always ideologically committed (Wesbrook, 1980:327). For example, in the American Army of World War II, reasons for the war were of small concern to conscripts who had no real impact on the wars issues, other than to fight and stay alive from day to day (Williams and Smith, 1949:167). The importance of ideology over logic is well demonstrated in the patriotic slogan "My Country, right or wrong!" (Grinker and Spiegel, 1945:40). "When the chips are down", feelings of obligation and loyalty to country, group, person or idea override opposing considerations (Grinker and Spiegel, 1945:40). Commitments desired by the organization depend on adherence to a "social system wider than the group". Direct, obvious threats against what a soldier is committed to encourage compliance with and lend legitimacy to orders given in the interests of those beliefs (Kellett,

1982:327). Ideological commitment is encouraged by a society's or group's willingness to punish or ostracize those who do not fulfill system demands (Wesbrook, 1980:262).

Although American soldiers have shown an aversion to patriotic appeals and the overt use of ideological symbols, their underlying commitments (latent ideology) to the worth of American society provide an important supporting condition in combat (Moskos, 1975:27).

Discipline. The fourth theory views combat motivation from the perspective of direct or indirect reliance on discipline (also known as fear of formal punishment). Discipline functions to ensure soldiers perform assigned tasks in the face of the intense pressures of self-preservation created by combat (Kellett, 1982:89,137,325; Wesbrook, 1980:248). Before the first World War, physical punishments were frequently used to discourage desertion. After 1914, with the increase in weapon lethality and the consequent need to disperse units in battle, the use of punitive discipline declined and has since been replaced by more informal, normative controls (Kellett, 1982:9,133). The decreased reliance on punitive measures to prevent desertion in combat was also due to a reduced element of deference in societal norms. Obedience in today's society requires an added element of persuasion concerning task legitimacy (Kellett, 1982:146,325).

Williams and Smith noted in World War II that coercive authority provided more than discouragement against desertion: it also lent support to those in authority during confusing and uncertain situations where no desirable options existed. This concept of discipline is illustrated by the following statement:

Such a situation provokes feelings of helplessness: any authoritative direction of a course of behavior is likely to be welcomed. (1949:117)

Hauser notes that for men facing the possibility of death in combat, the knowledge of severe punishments awaiting shirkers provides a "subconscious bolstering of courage". He goes on to state that an army which does not administer punishments for military crimes is being cruel rather than kind by not providing soldiers the sustaining knowledge of severe punishments awaiting misconduct (Hauser, 1980:191; Henderson, 1985:16).

Negative aspects of coercive authority are: (1) it is unable to foster active participation in combat (Kellett, 1982:326; Wesbrook, 1980:247); (2) its use does not improve the "spirit" of the troops (Kellett, 1982:325); and (3) its effectiveness decreases in combat and with increased combat experience (George, 1971:309)

Voluntary Compliance. The fifth theory of combat motivation is concerned with voluntary follower response to persuasive leadership and the "rightness" of demands and directives (Wesbrook, 1980:248; Ballard, 1989). Voluntary compliance relies on normative power where the individual

complies in a positive, willing manner (Wesbrook, 1980:248; Hollander, 1978:2). This is in contrast to the previously discussed Discipline Theory which involves either punishment or reward motivations (Ballard, 1989).

Voluntary compliance is an important aspect of combat motivation because moral commitments are the strongest force in overcoming a soldier's natural inclination toward passivity and inaction under fire (Kellett, 1982:326; Henderson, 1985:23). It is also important because the force of example and enthusiasm in combat of a few highly motivated men can have a disproportionate influence on an entire unit (Kellett, 1982:334). Finally, in World War II, Williams and Smith found it likely that soldier attitudes toward their officers were important in whether they continued to fight aggressively (1949:127).

It turns out that soldiers do not have to perceive a war as legitimate to continue fighting. For example, Israeli troops in Lebanon continued to advance, as long as strong cohesion existed and they had confidence in their combat leaders (Henderson, 1985:166). Several writers believe cohesion and confidence in leaders were missing in the American Army in Vietnam and account for the apparent inability of officers and NCOs to elicit compliance (Hauser, 1980:189).

Self-Preservation. The sixth combat motivation theory deals with the soldier's all-important goal of self-preservation (Williams and Smith, 1949:169). This is

an important motivation because it is a driving factor in social relations with leaders and groups and is therefore intertwined with many other motivating factors (Kellett, 1982:302,332; Williams and Smith, 1949:169). And though it is not a sufficient motive to sustain the will to fight, in situations of kill or be killed, soldiers will fight to survive (Kellett, 1982:332; Williams and Smith, 1949:169).

Moskos' research in Vietnam led him to conclude that soldiers recognize that their survival depends on support received from fighting companions, causing them to view the primary group as a source of self-preservation. He also stated the one-year rotation system emphasized the importance of self-preservation by providing individual termination dates which encouraged the view of Vietnam as a private war (Moskos, 1975:29,30,37).

Hate. The last combat motivation theory is based on feelings of hatred. There are three different forms in which hatred has been observed in combat: hatred at the moment, hatred of the enemy, and hatred of a people in general. (Ballard, 1989; Williams and Smith, 1949:159,160). For Americans in World War II, hatred of the enemy was found to depend on whether Germans or Japanese were being fought. However, hatred of the enemy was not a central factor in combat motivation because it was observed to be unstable and inconsistent (Williams and Smith, 1949:167). Various factors accounted for feelings of hatred in combat. Examples are witnessing enemy atrocities, feelings before

joining the army, and personal loss or trauma (Williams and Smith, 1949:162; Kellett, 1982:191).

Cohesion. It has long been recognized that cohesive groups sometimes develop goals which oppose the goals of the overall organization (Little, 1964:195; Kellett, 1982:101). One example is an informal quota limit set by workers on a manufacturing line. In this study the term "cohesion" will refer to the voluntary alignment of combat units with the military goal of providing the nation with an effective fighting force. A formal definition of cohesion was given in a study performed for the National Defense University:

the bonding together of members of a unit or organization in such a way as to sustain their will and commitment to each other, their unit, and the mission. (Johns and others, 1984:ix)

Unit cohesion is important because research has consistently shown individual bravery to be insufficient for the ordeal of combat: that a soldier's performance and morale depend on membership in a small, intimate, cohesive group (George, 1971:294,295; Baynes, 1967:102). As previously discussed, combat is an experience shared by a few close comrades, in what is called a "primary group". In combat, primary groups hold the strongest relationships, and are the main reason the American fighting man fights (Ballard, 1989). Wesbrook, in his study of the potential for military disintegration (he defines disintegration as "unwillingness of the average soldier to resist or attack the enemy")

identified five factors which are important in assessing an army's potential to disintegrate (1980:244, 265):

1. primary group cohesiveness
2. unit cohesiveness
3. national sociopolitical commitment
4. legitimacy of hierarchical demands
5. leader legitimacy

An interesting finding related to cohesion and primary groups is that in wars after World War I, disintegration has most often started in rear areas, not in areas of intense battle and high casualties where it is natural to expect it (Ballard, 1989; Wesbrook, 1980:257).

There are three types of control that can be exerted over military forces: (1) Coercive power (discipline or physical punishments); (2) Remunerative power (monetary incentives); and (3) Normative power (internalized values and norms). In the past, the U.S. Army used all three forms of control. However, in recent years U.S. society has rejected the use of severe punitive discipline for control of behavior in the military forces (Ford, 1968:60). Because of this, the loss of the draft, and the inception of the All Volunteer Force, the U.S. has chosen to emphasize remunerative power and to deemphasize normative power in its military forces. But because military service may require soldiers to expose themselves to hostile fire in accomplishing unit objectives, several writers assert that monetary incentives are insufficient to build an effective

fighting force; reasoning that no job is worth dying for (Henderson, 1985:22; Johns and others, 1984:xv). The strongest motivation possible to obtain objectives involving threat to life and limb has historically been normative controls, based on strong personal commitments to other unit members (Johns, 1984:ix.5.6; Henderson, 1985:23; Zais, 1985:60.63).

Researchers have proposed many factors to explain why some armies have remained cohesive under enormous stress in combat while other armies have yielded to enemies under relatively light conditions of combat (Gabriel and Savage, 1978:32). Following are some of the important factors.

1. Stability of personnel assignments (Henderson, 1985; Johns and others, 1984; Gabriel and Savage, 1978). Cohesion is built gradually by face-to-face contact between leaders and enlisted men over a period of time (Henderson, 1985:14). The Germans understood this principle in World War II and rotated entire army divisions into and out of combat for reconstitution of primary groups. The phenomenal success of the German Army in World War II has been partially attributed to this practice (Shils and Janowitz, 1948:185; Gabriel and Savage, 1978:38).

2. Interaction among unit members. Stable personnel assignments enhance cohesion by providing people more opportunity to interact and thereby get to know each other better (Ballard, 1989; Johns and others, 1984:32). Interaction (such as hard training) leads to attraction among unit

members which leads to cohesion (Ballard, 1989; Wesbrook, 1980:267).

3. Homogeneity. The more a group has in common, the greater its cohesion and the better fighting force it will be (Ballard, 1989; Johns and others, 1984:33,34).

4. Quality of leadership. Successful armies require leaders who are competent, set the example, and are willing to share in the sacrifices of their men (Johns and others, 1984:33; Gabriel and Savage, 1978:36).

5. Success. The ability of a unit to pull through a crisis successfully increases the confidence of its members as well as their esteem for the unit. Success produces expectations for more success in the future, along with greater likelihood of individuals accepting unit standards (Johns and others, 1984:33; Kellett, 1982:330; Wesbrook, 1980:267). The absence of success lowers a group's status and consequently its morale and esteem (Ballard, 1989).

6. Having a mission. Kellett states that cohesion requires having an objective or a mission (1982:320).

Ardant du Picq summarized the importance of cohesion to the average person in the military by stating:

Self-esteem is unquestionably one of the most powerful motives which moves our men. They do not wish to pass for cowards in the eyes of their comrades
(Zais, 1985:60)

Morale. The Greek military commander Xenophon (434-355 BC), who made the earliest known investigation into morale, wrote

You know, I am sure that not numbers or strength bring victory in war; but whichever army goes into battle stronger in soul, their enemies generally cannot withstand them. (Gal. 1986:551)

Military leaders have long considered a fighting spirit vital to success in combat, believing that if morale is lost, the battle is lost (Grinker and Spiegel. 1945:45; Baynes. 1967:93). For example, General George C. Marshall declared:

first in importance will be the development of a high morale and the building of a sound discipline, based on wise leadership and a spirit of cooperation through all ranks. (Knowlton, 1983:35)

In spite of the intuitive importance of morale and the fact that it has been studied by organizational psychologists since the 1930s, there is little agreement on how to define it (Knowlton, 1983:35). Consequently, morale remains a vague, but important term often used interchangeably with expressions like "esprit de corps", "motivation" and "attitude". Some people apply the term to individuals while others apply it to groups (Gal. 1986:549,550; Grinker and Spiegel. 1945:37; Newman, 1975:51). Grinker and Spiegel, in their work with Army Air Force pilots during World War II, contrasted good and bad morale:

"Good morale" is ordinarily used to describe a state in which the men feel confident, satisfied, united and eager for combat activity. "Poor morale" implies that the men are dispirited, dissatisfied, disorganized and shy of combat. (1945:37)

In his framework of combat motivation theories, Ballard classifies morale under the term "Bonding with the unit". He feels this is more specific than "morale" which is hard

to operationalize because it has so many different definitions. He also recognizes that many writers consider morale to be an element of cohesion within the small group; though he feels this also is less descriptive than "Bonding with the unit" (personal communication, 1989).

In a book titled Morale, John Baynes analyzes the importance of morale to the combat performance of a Scottish rifle battalion in one battle during World War I. In it, he developed the following definition of high morale:

It is a quality of mind and spirit which combines courage, self-discipline, and endurance. It springs from infinitely varying and sometimes contradictory sources, but is easily recognizable, having as its hall-marks cheerfulness and unselfishness. . . . In time of war it manifests itself in the soldier's absolute determination to do his duty to the best of his ability in any circumstances. At its highest peak it is seen as an individual's readiness to accept his fate willingly even to the point of death, and to refuse all roads that lead to safety at the price of conscience. (Baynes, 1967:108)

Baynes identified the following peacetime characteristics of high morale: (1) cheerfulness; (2) pride in one's self, job, and unit; (3) a lack of bad discipline; (4) receiving visitors well; and (5) sharp salutes. The following indicated high morale in combat: (1) cheerfulness; (2) physical hygiene and low numbers reporting sick; (3) few unnecessary casualties; and (4) willingness to accept responsibility (1967:95;98). Grinker and Spiegel list four factors required for good morale: (1) faith in the common purpose; (2) faith in leadership; (3) faith in one's

comrades; (4) adequate health and a balance of work, rest and recreation (1945:37).

While many assume morale to vary along a single dimension, from "low" to "high", Dr. Reuven Gal, a psychiatrist and Reserve Colonel in the Israeli Defense Forces, studied morale from a multidimensional perspective. He analyzed prewar survey data on attitudes of Israeli soldiers who were on alert in the Golan Heights in May 1981.

Intercorrelations between morale and other survey variables revealed several major variables related to morale. However, a factor analysis revealed that, rather than being a broad, overarching dependent variable, morale is simply one of eight factors in a broader concept of military unit performance, one that could be called "unit climate" (Gal. 1986:563). In Dr. Gal's opinion, morale is not so much a function of the variables measured in the prewar surveys as it is one of several variables required for effective military forces. He goes so far as to suggest cohesion and morale may possibly be thought of as "two aspects of the same factor" (Gal. 1986:560). The factors determined from Dr. Gal's analysis were:

1. Confidence in senior commanders
2. Confidence in one's self, team, and weapons
3. Unit cohesion and morale
4. Familiarity with one's mission and frontage
5. Confidence in immediate commanders
6. Enemy evaluation

7. Legitimacy of war
8. Worries and concerns

(Gal. 1986:546).

Morale is important because, as mentioned previously, weapons like the cannon and the machine gun do not allow modern military units to do battle in mass. And, as Ardant du Picq observed, high morale is needed to reduce feelings of isolation (and consequent feelings of abandonment) in battle which result from the increased distances between men in modern military forces (Zais. 1985:60). Grinker and Spiegel wrote of the eagerness men have for combat before they experience it. They state that once men have a realistic appreciation for what combat is, once it is stripped of its glamour and Hollywood trappings, their individual motivations, which they had before experiencing combat, weaken and require some form of support lest they lose all determination to perform in combat (Grinker and Spiegel. 1945:44,45; Moskos, 1975:31). They wrote:

The additional force necessary to keep the men's determination to continue in combat at a high level . . . is recognized as group morale. It is the result of . . . interpersonal relationships . . . and, specifically, of the intense loyalty stimulated by the close identification with the group. The men are now fighting for each other and develop guilty feelings if they let each other down. (Grinker and Spiegel, 1945:45).

Based on this review of the morale and cohesion literature, Reuven Gal's conclusion that they may be "two aspects of the same factor" looks probable. In any case, cohesion

and morale are closely related due to their dependence on relationships between comrades in battle.

Leadership

For centuries military historians and scholars have considered leadership to be of great importance to effectiveness in combat (Waller, 1982:20). Throughout the literature on military cohesion, leadership is consistently stressed as the most critical element to obtaining cohesive, effective organizations (Johns, and others, 1984:33). Years of academic research on leadership have generated countless theories and investigations, along with more than 350 definitions of leadership (Broedling, 1981:71,74; Bennis and Nanus 1985:4). Consequently, leadership is complex and diverse, not tidy or well-defined.

For this research, leadership will be defined as the process of influencing the activities of a person, or a group, in efforts expended toward goal achievement in a given situation. (Peppers, 1989:1)

Leadership is an influence process because people are social in nature, with behavior often governed by feelings or sentiments rather than by logic (Kimmel, 1987:65; Kellett, 1982:151). The leader's real "power" lies in his ability to persuade others to want to follow without the use of threats (Hollander, 1978:2). For this reason, the leadership process may be thought of as "voluntary compliance" on the part of followers (Ballard, 1989). However, follower response to a leader's actions, in turn, influences the leader's future actions. Therefore, leadership, is not

something based solely on what a leader does, but is a two-way process involving the cooperative efforts and influence of followers (Hollander, 1978: 2,7).

Leadership behavior sufficient to elicit a moral commitment from followers depends on "personal empathic relationships with subordinates", along with control being exerted through normative power (Johns and others, 1984:xiii; Henderson, 1985:11). Leaders must also balance this need for personal relationships with the need to maintain a separation from their followers (Hauser, 1980:193). Grinker and Spiegel note that because sacrifices in combat are made on a personal basis, the relationship between the leader and his men is "of utmost significance to good morale and success in battle (1945:46). In contrast, management behavior uses rules and sanctions in impersonal relationships to obtain compliance (Johns and others, 1984:xiii).

While the primary group plays a vital role in sustaining individuals against stress in combat, it is primarily the leadership of sergeants and junior officers which builds cohesion into military units. It is at this level that individuals are influenced to support unit goals or objectives that naturally conflict with the sense of self-preservation (Henderson, 1985:129,111). By exercising leadership in stable, long-term relationships at the small-unit level, leaders influence primary groups to align themselves with the organization's values and ideals, and thereby cause

organizational values to become an individual's guide for day-to-day behavior. Through the leader's influence, soldiers come to believe in the system they are sworn to defend, and, if necessary, die for (Henderson, 1985:129; Wesbrook, 1980:259; Johns, 1984:2; George, 1971:307; Kellett, 1982:103). Grinker and Spiegel (1945:46.47) summarize the reasons several authors give for the importance of leadership in combat (Wesbrook, 1980; Kellett, 1982; George, 1971; Henderson, 1985; Williams and Smith, 1949):

1. The men's personal safety in combat depends on the leader's skill, good judgment and knowledge. Men are willing to die if necessary, but are not inclined to risk their lives due to a leader's incompetence.
2. Followers tend to identify with protective exemplary authority, and absorb the personal attributes of leaders who provide this kind of authority. Consequently, leadership by example tends to obtain the performance desired in combat. In contrast, the worst leaders lead from the rear and cause soldiers to question the legitimacy of leadership demands (Wesbrook, 1980:262). One important consequence of leadership by example in combat is the cost to its practitioners: disproportionately high casualties (Kellett, 1982:268).
3. It has been repeatedly shown that leaders who have the confidence and affection of their men are likely to evoke incredible effort and sacrifice from them. This is because coercion on the modern battlefield is impractical in

organizations based on normative compliance (Wesbrook, 1980:263).

Several characteristics of good leaders in combat are given in Table 3.

TABLE 3
Characteristics of Good Combat Leaders

- A. Field Marshall Erwin Rommel (in Marashian, 1982:27)
 - 1. Mental gifts of high order
 - 2. Great strength of character
 - 3. Flexibility of mind and eager acceptance of responsibility
 - 4. A fitting mixture of caution and audacity
 - 5. Tactical and technical competence
 - 6. Initiative and energy
 - 7. Leadership by personal example
 - 8. The ability to establish personal contact without a loss of authority
- B. Grinker and Spiegel (1945)
 - 1. Technical competence in military duties
 - 2. Strength of character and decisiveness
 - 3. Good judgment concerning men's tolerance for combat conditions
 - 4. Fulfills the role of a just and impartial father
 - 5. Gives every consideration possible to the creature comforts of his men

III. Methodology

This chapter describes the method used to accomplish the research objectives. The first section in this chapter describes why the structured interview method was chosen. The next section discusses how the research instrument was developed. The third section describes how interview respondents were obtained. And the last section describes procedures followed in conducting the interviews.

Method Justification and Background

A literature search for primary and secondary sources in the areas of Air Force ground combat experiences and Air Force combat behavior was performed using the services and information available at several locations. These locations included the Air Force Institute of Technology (AFIT) School of Engineering and School of Systems and Logistics libraries at Wright-Patterson Air Force Base; the Simpson Historical Research Center and the Air University Library at Maxwell Air Force Base; the Wright State University Library; and specific topical searches performed through the on-line computer database services of Defense Technical Information Center (DTIC) and the DIALOG Information Retrieval Service available through the AFIT library. This search revealed hundreds of reports, books and articles written on a variety of aspects of Army and Marine Corps units in ground combat but failed to reveal similar sources which describe Air

Force ground combat experiences. This result was not surprising considering the wartime role and mission differences between traditional ground fighting services and the Air Force. Due to the lack of research available, data collection was required to accomplish the research objectives.

Precedent Studies of Combat Behavior. The lack of research noted above required determining the basic aspects of what CE personnel experienced in combat in Vietnam before proceeding with research into answers on how to improve readiness for war (Ballard, 1989). This category of research is termed "exploration" and is used when the researcher does not have a clear idea of the problems that must be dealt with in the study (Emory, 1985:62). And because many studies in the past have relied on interviews with combat-experienced soldiers, the same method was selected for this study. For example, in Men Under Stress, Grinker and Speigel observed several thousand Air Corps flyers in order to understand "the psychological mechanisms of 'normal' individuals in situations of stress" (1945:ix). Also, in their classic work The American Soldier, Samuel Stouffer and his associates systematically surveyed over 500,000 American soldiers out of combat in World War II on their attitudes and combat experiences (Ballard, 1988:199; Moskos, 1975:32). And, though less scientific, similar studies were attempted much earlier, such as Captain William Siborne's detailed survey of surviving Waterloo officers in

1830 (Kellett, 1982:13). Also, in 1965 and 1967, Charles Moskos collected data on the linkage between ideology and primary groups in combat performance in Vietnam through personal interview and informal observations (Moskos, 1968:3,4). As these studies show, the use of experience interviews is a well established method for obtaining information on attitudes, group dynamics and other factors important in combat.

Research Instrument Selection. The structured interview was used for data collection in this study. Of the three survey methods available, (telephone, mail, and personal) the personal interview was judged to be the best means of obtaining potentially personal information. This was because it gives the researcher the greatest control over respondent selection and the conditions under which responses are obtained (Emory, 1985:160). Telephone interviews were originally ruled out because the literature indicates they pose a limitation on the complexity of questions, because participants tend to provide less complete responses to them, and because of increased tension during the interview due to disruptive pauses and the lack of non-verbal communication (Emory, 1985:171; Gajeski, 1988:22). However, when difficulties were encountered in locating Civil Engineering Vietnam combat veterans in the Dayton, Ohio, area for personal interviews, the survey method was expanded to include telephone interviews. Mail surveys were considered inadequate because they do not allow

for clarification of ambiguous responses and do not provide the insight required when operating in unknown areas (Emory, 1985:64, 172). A description of how participants were obtained is provided in a later section of this chapter.

Method Limitations and Assumptions. Personal and telephone interviewing have weaknesses that limit the ability to obtain quality information. Both, for example, depend heavily on respondent cooperation. Both require a shared interpretation of questions and concepts presented by the researcher, and, of course, respondents may intentionally provide misleading information (Emory, 1985:158-171). Because error and bias can be introduced into results through the way questions are asked, the use of controlled question wording, disciplined voice intonation, and purposeful question sequence are essential to obtaining accurate information (Gajeski, 1988:22).

The possible misinterpretation of responses is another limitation of this method. Clear, simple and limited questions help reduce misinterpretation of responses during content analysis (Gajeski, 1988:22). In applying interpretations to survey responses, researchers must bear in mind these responses are statements made by others which may be true or untrue (Emory, 1985:159). However, the validity of responses to the interview questions can be determined to some extent by comparison among responses and by a comparison with information in the literature.

Finally, telephone interviews are more limited than face-to-face interviews because of the lack of non-verbal communication. Interviews by phone have also been found to result in less complete responses to questions and are less rewarding to those being interviewed (Emory, 1985:171).

The time-consuming nature of personal and telephone interviewing limited the number of interviews which could be performed (Emory, 1985:161). Due to time constraints, a feasible number of interviews for this research was estimated as between fifteen and twenty. Seventeen interviews were actually obtained.

It was also recognized that interviews concerning experiences that occurred between eighteen and twenty-four years ago pose the potential for memory distortion, selective retention and selective reporting (Gajeski, 1988:3; Kellett, 1982:13). However, it was the opinion of the thesis reader, whose background is in social psychology, that valid data on behavior in combat can be collected with a proper interview and a recognition of data limitations. It is the intense and unique nature of combat that makes possible a valid recall of these experiences.

Participant Selection Process

The research population was all CE personnel who experienced combat in Vietnam. Seventeen CE Vietnam combat veterans formed the sample of this population (Appendix C provides a description of this sample). The researcher's

original intent was to gather data strictly through personal interviews using a sample of convenience drawn from the Dayton, Ohio area. Six participants were located in this way. However when difficulty was encountered in locating participants by word of mouth, an advertisement was placed in the "After-Burner" (see Appendix B), an Air Force retiree newsletter, requesting interviews with Civil Engineering Vietnam Combat veterans. Another study, unrelated to this study, also involved interviews with combat veterans and requested participants in the same advertisement. There were approximately 50 Civil Engineering responses to this article. Responses were screened for appropriate experience by telephone; ten were selected for telephone interview and one was selected for personal interview. The time available constrained the number of interviews that could be accomplished.

Data collection was not confined to any particular period of the Vietnam conflict. Participants were selected from Base Civil Engineering, Prime BEEF and RED HORSE units, officer or enlisted. The data sought concerned experiences before, during, and after combat attack while in South East Asia. The literature review was performed to identify the general areas and factors that may have affected respondent behavior (Gajeski, 1988:3). Because an objective of this study was to identify important factors, respondents that were able to provide insight into the ranges of combat behavior and combat situations were considered important to

the study. Hence, a representative cross-section of combat experiences was not required (Emory, 1985:63).

Interview Construction

The structured interview used in this study (Appendix A) had its origins in a structured interview developed by Major Antone Gajeski and Lieutenant Colonel John Ballard for a similar AFIT thesis titled "Combat Aircrew Experiences During the Vietnam Conflict: An Exploratory Study" (Gajeski, 1988). Colonel Ballard served as thesis reader for the present study, and provided direction and insight in modifying Major Gajeski's instrument to obtain appropriate information on Civil Engineering combat experiences. This required several meetings with both the thesis advisor and the reader. Due to the similarity of the two interview instruments, only a few of aspects of the instrument's development will be discussed here.

To preserve respondent interest and stamina, the interview length was planned for about one hour. Questions were written in conversational language to permit direct reading to the respondent. General, easy questions were asked before more difficult or sensitive ones. Questions within interview subsections were designed to build on one another, with initial questions intended as memory joggers and preparation for the more sensitive parts of the interview. The reader is referred to Major Gajeski's thesis for more detailed information on question sequencing, wording, and type.

Conducting the Interviews

As recommended in the literature, before conducting interviews the researcher briefed each respondent on the interview purpose, how the information would be used, and that respondent identity would remain anonymous. Research has shown that several factors influence respondent cooperation in personal interviewing. One factor is the degree to which the respondent anticipates the interview as a "pleasant and satisfying" experience. Another factor is how important and worthwhile the respondent perceives the survey to be. Finally, it is important to relieve any mental reservations participants may have concerning the interview (Emory, 1985:162). The military uniform was worn for the personal interviews to demonstrate the study's legitimacy and to encourage a professional exchange of ideas (Gajeski, 1988:31).

All respondents were contacted by telephone to arrange an acceptable time and place for the interview. Four of the seven personal interviews were performed in the respondent's office; the other three occurred at the respondent's home. Ten interviews were conducted by telephone.

All participants agreed to having the interviews tape recorded. Tape recording is important to personal interviewing because it frees the interviewer to concentrate on what the respondent is saying, verbally and nonverbally. Recording the interview also provides a verbatim record, limits the distractions of excessive note taking, and

removes "inadvertent cues to discuss at length issues taken note on and skirt those for which no note was taken" (Brenner and others, 1985:154). Having a tape recording later proved invaluable in accurately analyzing responses.

In general, interview questions (see Appendix A) were read directly from the questionnaire to all respondents. Interview techniques suggested in the literature were used to obtain full, accurate answers to questions. These techniques include question repetition, nondirective clarification and nondirective probing. A key concern during the interviewing was to interact with the respondent in a nondirective fashion, that is, to avoid implying that a question had a correct answer (Brenner and others, 1985:31,158; Emory, 1985:164,166).

Content Analysis

Data from the interviews was analyzed for content. This involved a close analysis of interview tape recordings to identify regularities among responses in terms of concepts and themes (Mostyn, 1985:115). Notes taken from the analysis of recordings are included in the appendices of this report and were used to simplify comparison of responses and to identify trends and important issues. As appropriate for this exploratory study, analyses were basic and qualitative. A preliminary review of the data obtained from the interviews resulted in twelve categories of information being chosen for content analysis. Categories were

chosen for analysis on the basis of the researcher's estimate of their ability to yield meaningful information on the Air Force combat experience.

IV. Results

This chapter presents the results from the experience interviews described in the research methodology, Chapter Three. This section is intended to provide the reader a summary of respondent comments that were used to answer the investigative questions posed in Chapter One. The researcher, the advisor and the reader reviewed several categories of information on which data was collected and selected the following twelve for discussion: (1) description of participants; (2) description of enemy attacks; (3) return of fire; (4) description of bonds with the unit; (5) evaluation of unit leadership; (6) description of an effective combat leader; (7) morale factors; (8) the biggest problem faced in the combat zone; (9) recommendations for combat preparation; (10) desired training; (11) initial reaction to hostile fire; and (12) training and perceptions of preparedness. This selection was based on a preliminary evaluation of areas with the most potential for providing meaningful insight into what the Vietnam combat experience was like for Civil Engineering personnel. Other areas of the interview with potential to reveal important combat behavior information are recommended in Chapter Six. Because the literature review did not reveal research in the area of Air Force ground combat experiences, the results presented concern only the responses to the interview questions. Data from the interviews are in Appendices C through O and are sorted

by respondent to simplify cross comparison of responses. As mentioned in Chapter Three, CE personnel with Vietnam combat experience were identified by word of mouth and through an advertisement in an Air Force retiree newsletter called the "After-Burner" (Appendix B). Interviews were conducted in person or by telephone using the interview questionnaire in Appendix A.

The Participants

Seventeen people with Civil Engineering combat experience in Vietnam were interviewed for this study. Appendix C provides information on respondents at the time of their service in Vietnam. Respondent numbers six, seven, nine and twelve were still on active duty, the rest were either retired or serving in the reserves. Those living in the Dayton/Wright-Patterson AFB area were interviewed personally, others were interviewed by telephone.

Ages while in Vietnam ranged from 20 to 45. Rank ranged from Airman to Major, with the most frequently occurring rank being Staff Sergeant, five had been officers in Vietnam. Personnel interviewed had been assigned to Base Civil Engineering (BCE), RED HORSE, and Prime BEEF organizations at nine different locations in Vietnam. Although the majority of information presented concerned only experiences in BCE and RED HORSE units. Assignment to RED HORSE units often involved temporary duty in detachments away from the main base. Consequently, experiences described by many of

the RED HORSE respondents did not occur in one location.

Respondent number four in Appendix C served in a RED HORSE unit as well as a BCE unit. Respondent number 13 (with Type of Unit labelled "PB/RH") had served in both a RED HORSE unit and on a Prime BEEF team. Respondents numbered ten and eleven were assigned to small detachments which supported specific units either on base or at an isolated location. Respondent number twelve was assigned from Headquarters Seventh Air Force, Tan Son Nhut AB, to serve as the resident Air Force Regional Civil Engineer (AFRCE) at Cam Ranh Bay. As such, he was not formally a part of the BCE unit at Cam Ranh Bay, but worked with it and observed it. Jobs described in Appendix C are still commonly performed in the Civil Engineering career field.

When asked why they joined the Air Force, only one of the respondents cited a desire to serve his country; five stated they either had had a long association with the military or just liked the idea of serving in the military. Although each had his own reason for joining, the most frequent reasons involved (1) staying away from service in the Army, (2) interest in aircraft or flying, and (3) a desire to improve themselves. Approximately seventy percent volunteered for duty in Vietnam. Reasons for volunteering were: (1) feelings of duty; (2) a desire for career advancement; (3) the fact that assignment to Vietnam would eventually have happened anyway; and (4) a desire to change location. The majority of those who did not volunteer,

stated they accepted the assignment as necessary and with a positive attitude.

Description of Enemy Attacks

Enemy attacks consisted of combinations of mortar, rocket and small arms fire. Due to base protection provided by U.S. Army (USA) and Republic of Korea (ROK) troops, at some locations only small arms fire was received. Data on attack frequency, duration and extent of damage are contained in Appendix D. Ten respondents commented that enemy fire was too inaccurate or damage was too minimal to provide more than harassment. The other seven stated that damage was extensive at times. An interesting finding was a wide variety of respondent exposure to hostile fire. For example, frequency of attack ranged from "occasional" to "continuous", with attack duration ranging from "a few minutes" to "all day sometimes". Two respondents stated duration of enemy attack was measured by the number of incoming enemy mortars. Respondents nine, twelve and fifteen had been stationed at Cam Ranh Bay; all of these reported light enemy activity due to being in a relatively secure location. Respondents at Tuy Hoa also reported low enemy activity, due to having USA and ROK troops performing combat patrols and providing air base protection. Conversely respondent eleven, assigned to a radar detachment at Dong Ha just south of the Demilitarized Zone, reported regular enemy attacks which sometimes lasted all day. Responses from three

participants who were assigned to Da Nang revealed differing levels of enemy activity at different time periods. Other respondents who had been assigned to the same bases reported nearly the same enemy activity level regardless of the time frame.

In response to the question "What kind of damage did the enemy do in these attacks?", six of the twelve who had been assigned to BCE units stated enemy attacks caused light or no damage to the base, while the other six rated damage from enemy attacks as respectable. Only one of the RED HORSE respondents reported any significant damage from enemy attacks.

Small arms fire was frequently directed at BCE power linemen as well as RED HORSE and BCE personnel who were away from the main base. Small arms fire also frequently occurred during travel in convoys. Four respondents reported Civil Engineering personnel were killed during their tour, five reported their units having had personnel wounded.

An interesting finding is that all five of the officers interviewed reported a lower frequency of enemy attacks and lower levels of enemy damage than did enlisted respondents. This could have been due to the low number of officers interviewed compared with the number of enlisted respondents; or the time frame and location may account for this finding. There were not enough respondents assigned to the same locations to make this determination.

Return of Fire

Responses to the two questions "Were you able to return fire?" and "Did anybody return fire?" are paraphrased in Appendix E. They were categorized according to: (1) those who returned fire; (2) those who did not return fire but had base defense provided by the Security Police, the U.S. Army, the U.S. Marine Corps or the Korean Army; and (3) those who were at bases where fire was not returned at all.

Six respondents answered in the first category, those who returned fire. Two of these six were in BCE units and had returned fire as Security Police augmentees (both of these respondents were airmen). Both stated they preferred being on augmentee duty with a weapon to sitting in a bunker. Three of the six were on convoy duty or were off base when they returned fire; two of these three were in RED HORSE squadrons. The last respondent in this category was the Base Civil Engineer at Tuy Hoa AB who returned fire from the base perimeter to fend off sniper attacks on power linemen.

Six responded that base security was adequately provided by another agency such as the Army or Security Police. A common response was that small arms fire was returned from the perimeter. One responded that Civil Engineering had been tasked with manning the perimeter; he indicated that other units also had sections of the perimeter they were responsible for protecting. Another, assigned to a special detachment at Dong Ha, stated the Army and Marines defended

the area. As expected, all six were in BCE outfits. Half stated that Security Police provided base defense.

Six respondents answered that no one returned fire of any kind. Four were in RED HORSE, two had been in BCE units, and one had served on a Prime BEEF team. One of the RED HORSE respondents stated the rules of engagement prohibited the return of fire without permission of the District Governor. No special comments were offered by the two who served in BCE units. Respondent thirteen stated Prime BEEF personnel rarely left the base during the 1965 time period. Note that the number of responses adds up to nineteen because two respondents served two tours in Vietnam.

Bonding With The Unit

Paraphrased responses to questions 28 and 29 are tabulated in Appendix F. Because of the training and mission difference between RED HORSE and BCE units, responses will be presented separately.

The twelve who had been assigned to BCE units responded to the question "How would you rate the cohesion in your unit?" in five categories: (1) Excellent; (2) Good; (3) Fair; (4) Poor; and (5) Mixed. Because questions concerning cohesion were not worded to obtain specific ratings (such as "fair" or "excellent"), the researcher also considered respondent tone of voice in addition to the answer in classifying responses.

Five interviewees categorized BCE unit cohesion as "Excellent". Reasons given for such high cohesion were: (1) doing things together; (2) the need to depend on others to get the job done; and (3) a natural bonding and brotherhood that develops among men in heavy combat. The last reason was stated by respondent eleven, who had been stationed at Dong Ha.

Two responses fell into the "Good" category, one response was "Fair", and one response was judged as "Bad". The respondent who rated cohesion "Bad" had been previously assigned to a RED HORSE unit in Vietnam and rated cohesion in the BCE unit from a perspective of his prior experience. He stated that, compared with RED HORSE, the BCE unit at Pleiku had a far greater degree of social separation among its shops than did RED HORSE. This respondent also noted that personnel coming into the BCE unit had very little training compared to personnel assigned to RED HORSE units.

Two respondents gave a mixed response to questions concerning cohesion. When asked to rate overall unit cohesion, these respondents answered "good" and "pretty good"; but when asked whether they had a close association with the whole unit they responded "no".

Respondent number twelve was assigned as the Air Force Regional Civil Engineer detached from Headquarters Seventh Air Force to Cam Ranh Bay and as such was not formally a part of the local unit and had difficulty answering these

questions. Consequently, the indirect observations provided by this respondent were not included in this section.

All six responses from those assigned to RED HORSE units rated unit cohesion as "Excellent". In the responses, there was a consistent theme of belonging to and identification with the unit. Two respondents noted that in all their assignments, before and since, they had never seen such high cohesion. Respondent sixteen's tour was in a small (50 to 100 people) RED HORSE detachment, away from the main unit. He noted that people in the detachment grew very close due to working six and seven days a week and eating and sleeping together; and that seeing each other frequently throughout the work day may have factored into the high cohesion of the unit. He also mentioned that some animosity developed between his detachment and the parent RED HORSE outfit due to geographical separation and aggravation over the better supplies and equipment received by the parent unit.

There were not enough people with tours at the same location to determine if there was a pattern in answers to cohesion questions in the BCE units.

Unit Leadership

Appendix G contains paraphrased responses to question 52, "How good was the leadership in your unit?". RED HORSE and BCE unit responses will again be presented separately. Respondents who had experience in BCE units gave responses in five categories: (1) Excellent; (2) Good; (3) Fair; (4)

Poor; and (5) Mixed. As in the previous section, "Bonding With The Unit", questions concerning leadership were not worded to obtain a specific response (such as "fair" or "excellent"), consequently the researcher again considered respondent tone of voice in classifying the responses for use in this chapter.

Four interviewees stated that BCE unit leadership was excellent. In this category, only two additional comments were offered: (1) a Staff Sergeant assigned to Da Nang observed the officers and one Chief Master Sergeant were very knowledgeable; and (2) a first lieutenant, who is now an active duty colonel commented that senior leaders were very conscientious, understood what was going on, and knew when to "call a halt to horseplay" and when it was therapeutic.

Two "Good" responses were received. Respondent number three related a story about a Base Civil Engineer whose defensiveness and inability to decide made him hard to work for, and contributed to his later being relieved. There were two "Fair" responses. Contributing to this rating were the following factors: (1) at Pleiku there was a multitude of different sleeping arrangements for enlisted members, based on rank and position, which detracted from unit spirit; (2) at Bien Hoa most of the officers were competent but many were young and trying to learn. Only one respondent rated BCE unit leadership as "Poor". He felt that decisions to have senior personnel working for junior

personnel, based on level of experience, were disruptive and totally wrong. He also stated that a squadron commander gave a bad first impression because he threatened the career of a senior NCO. In the "Mixed" category, respondent one described the leadership as "good and bad" and commented that some of the senior NCOs did not have the experience that was needed to lead because they had been cross trained from other career fields. Respondent eight also described the leadership as "good and bad". He stated that, though the commander was excellent, junior officers did not have leadership training and consequently did not know what to do in a lot of situations. He went on to say that a person cannot lead others without understanding the responsibilities of subordinates, nor without practice. He also disagreed with a practice on the part of officers: not asking NCOs for advice.

Three of the six RED HORSE respondents rated unit leadership "Excellent". One respondent attributed the high quality of leadership to the fact that most of the people in his unit were "hand picked". He did, however, mention one colonel, assigned from the Pentagon, who would not listen to his NCOs' advice. Respondent seventeen commented that unit cohesion and enthusiasm were so strong that orders were not necessary, that when tasks were suggested they were accomplished.

The remaining three RED HORSE respondents commented that unit leadership was "Fair". Only one respondent

provided a substantial comment in this area: the squadron commander had been fired from a position in operations and was not a trained civil engineer. This commander was a detriment to the squadron because he lacked common sense and spent as much time off station as he could get away with.

Description of Effective Combat Leaders

Question 53 asked "How would you describe an effective combat leader?". Paraphrased responses are contained in Appendix H. After sorting, seventeen unique categories of response were found. Because fifteen of these categories contained one or two responses, only two patterns were identified. The most frequently mentioned trait had seven respondents and was identified in two forms: (1) job knowledge; and (2) knowing what he wants. The next most mentioned attribute was the ability to make the right decision quickly, with or without a lot of information. Three respondents identified this trait.

Morale Factors

Appendix J contains paraphrased responses to interview questions 24 and 25. Although respondents identified a total of 12 factors that were helpful in getting through the tour, the following five were the most commonly reported: (1) work; (2) support from home; (3) friendships; (4) anticipation of the tour's end; and (5) religion.

Fourteen respondents identified work as helpful in getting through the tour; many indicated that it provided a

diversion from dwelling on the negative aspects of the situation.

Bigest Problem in the Combat Zone

Appendix K provides paraphrased responses to Question 15, "In your opinion, what's the biggest problem faced by Civil Engineering in a combat zone?". There were five response categories: (1) insufficient combat training; (2) lack of resources; (3) insufficient technical training; (4) lack of security from hostile fire; and (5) unknowns and unscheduled activities.

Six respondents identified insufficient combat training as the biggest problem experienced. Comments which further explain the biggest problem follow: (1) respondent five, who had been assigned to Da Nang AB in 1969, stated there was a lack of familiarization with weapons and combat tactics. He also said that today's Prime BEEF and Rapid Runway Repair training are an improvement over training given during the Vietnam era. (2) Respondent eight said that officers and NCOs did not know what to do in the combat zone, that they waited for someone to give an order. (3) Respondent thirteen, a plumber on the second Prime BEEF team deployed to Vietnam, commented that the lack of training on constructing new facilities was a limiting factor in accomplishing the team mission. He went on to say the integration of civilians into the peacetime military force and the appearance that few people care about contingency training, are two

reasons for a lack of proficiency in Prime BEEF readiness.

(4) Respondent number four, an Airman assigned to Pleiku AB in 1968, also observed a lack of contingency training of personnel assigned to BCE units in Vietnam. His prior RED HORSE training and tour greatly contrasted with his experience in the BCE unit. He noted the "unit spirit" of his previous RED HORSE unit which had trained together prior to going to Vietnam, was missing in the BCE organization. This respondent also commented that his RED HORSE training prepared him well for his tour in Vietnam with RED HORSE.

(5) Respondent sixteen, a second lieutenant in Vietnam, expects future conflicts to be more destructive than the Vietnam War. He specifically contrasted the highly destructive environment anticipated in European scenarios with the inaccurate, harassment fire of the Viet Cong. (6) Respondent seventeen commented that RED HORSE was trained just enough in combat tactics "to get killed". He also commented that because RED HORSE units received minimal combat training, its personnel did not know what they were getting into in Vietnam. This respondent was assigned to his unit out of cycle and consequently did not receive the sixty-day training.

Four respondents identified a lack of resources as the biggest problem in the Vietnam combat zone. One who had been a captain assigned to Tuy Hoa AB, noted that because requests for urgent work don't stop when there is a lack of equipment and tools it is essential to ensure that as many

required tools are available as possible. Another respondent who had been assigned to RED HORSE stated it was hard to get routine tune-up parts for heavy equipment.

One respondent stated that Civil Engineering personnel he worked with were technically unprepared for the work in Vietnam. He added that this problem was aggravated by having many different types of generators to repair. Another respondent highlighted the unwillingness of military workers to perform outside their own crafts as being a problem in a combat environment. He sees this as harmful because people would not be able to cross over and help other parts of the organization that needed it. He went on to say that because this is a problem in today's CE organizations he expects it to also be a problem in future combat environments.

Another area that two respondents saw as a significant problem dealt with security from hostile fire. Respondent number two, who had been a Base Civil Engineer in Vietnam responded that protection of troops from incoming fire was the biggest problem in a combat zone. Another respondent identified security from sniper fire directed at RED HORSE equipment operators as the biggest problem.

The last category of the biggest problem CE faced in the combat zone, unexpected and unscheduled activities in war, was identified by two officers. One of the officers noted that, due to the increased urgency, tasks in a combat environment are done a lot less systematically than they are

in a peacetime environment. He also stated that things were done a "day at a time" rather than being planned a month in advance. The other officer listed what he thought would be significant problems in the next conflict; at the top of his list was the unanticipated conditions which are characteristic of war.

There was no apparent pattern among the responses to this question from BCE and RED HORSE respondents. Nor was there an apparent pattern among enlisted and officer responses.

Recommendations For Combat Preparation

Appendix L provides a brief list of paraphrased responses to Question 16, "Do you have any ideas on how we can better prepare CE troops for operations in a combat zone?". These responses fell into the following five categories: (1) provide realistic combat training; (2) inform those going into a combat zone on what to expect; (3) ensure an adequate supply of tools and equipment are on hand to do what is expected; (4) provide better training to perform the job; and (5) all preparation was adequate.

In response to Question 16, twelve of the seventeen respondents recommended realistic combat training. Following are summaries of the strongest feelings expressed by respondents concerning the need for better training: (1) Respondent four, who served a tour with RED HORSE in Vietnam and was later assigned to a BCE unit in Vietnam, said he did

not know how to respond to his first exposure to incoming mortars and rockets. He commented his RED HORSE training prepared him for convoy ambushes and sniper attacks but did not prepare him for the sounds and destructive potential of mortars and rockets. He suggested training CE personnel for response to different types of weapons. (2) Another respondent, who had been assigned to a BCE unit at Phu Cat AB felt strongly that it was a bad policy for the Air Force to issue small arms (M-16s) to CE personnel without providing training on how to properly use them. He reasoned it did not make sense to ask CE personnel to perform the same role as the Security Police without giving them the same training. Specifically, there was no training given on how to set up a patrol, a convoy, or a proper defense. As an example, convoys in Vietnam got "shot up" because they violated a basic convoy rule by stopping the convoy to return fire. He stated that the Prime BEEF concept is good, but felt that the training given at Eglin AFB does not teach CE personnel what could happen in combat and how to respond. (3) Another Civil Engineering combat veteran who had been assigned to Bien Hoa AB recommended training Prime BEEF personnel in such a way that they will understand they may have to defend what they construct. Because defense of some installations was left to Security Police and Civil Engineering personnel, this particular respondent served as a Security Police augmentee during the Tet Offensive of 1968, and directly participated in fire fights with the enemy. Another

respondent suggested having a "nucleus" of Security Police trained CE personnel that would be able to provide some experience to CE units that deploy to combat zones. (4) Another recommendation was to use combat veterans as a source of guidance and information in Prime BEEF training. This respondent felt it is necessary to involve people in Prime BEEF training who know what to expect in combat. (5) Another combat veteran has observed today's Prime BEEF training and feels the Air Force is not giving CE units the training they will need to survive in a combat zone. He felt that a lot of Civil Engineering people will be killed in future combat actions because of inadequate preparation. He recommends Air Force CE personnel going through an Army combat training course which simulates combat conditions. He felt that CE personnel seeing the effect of having to perform a mission with a significant number of combat losses would "open their eyes" to the realities of combat. (6) Three respondents recommended employing Prime BEEF units away from home stations to remote locations and having them perform a mission. They stressed the unfamiliar conditions under which CE units will have to operate in time of war are not being emphasized enough to provide adequate training.

Two respondents suggested the Air Force should provide indoctrination on what to expect prior to sending people into combat zones. Suggested areas for indoctrination included the social environment, personnel problems and supply and equipment problems. One of these respondents

observed a high level of frustration among some of the troops in Vietnam because of equipment and supply problems and suggested that familiarity with these problems before going to Vietnam would have provided time to adjust to not being able to accommodate all the demands placed on the organization. As noted in questions concerning training desired prior to Vietnam, having more information about the situation would have alleviated some of the anxiety that accompanies an unfamiliar experience. Another comment related to the need for indoctrination, involved the preparation of contingency plans in advance of deployment to a combat zone.

The third area suggested for improving preparation of CE personnel for a combat environment was ensuring adequate tools and equipment in the deployment package, for the initial and follow-on forces. This suggestion was made by a respondent who had been an officer assigned to Tuy Hoa AB, an air base that was well protected by U.S. Army and Korean forces. This respondent stated that this protection prevented him from involvement in "hot combat"; a factor which may account for his emphasis on tools and equipment as a major problem.

The fourth area, suggested by two respondents, involved improving the technical training provided to CE personnel. Specifically, respondent six stated Air Force technical schools are not currently teaching the repair of modern control systems which are in place and that are becoming

more common. Instead, he stated, technical schools are teaching the repair and maintenance of some of the older systems in the inventory. Respondent ten suggested periodic training on equipment maintenance and repair in a realistic environment. He made the comment that in Vietnam, people did not know "the fundamentals" of generator maintenance and repair, and that many of those assigned in his unit had not learned all they should have from their time in technical school. The last suggestion in this category was to have CE personnel minimally competent in other specialties. This respondent considered the tendency of skilled workers to want to perform only one job as very counterproductive in a combat situation.

The final category consisted of two responses. One respondent, who had been assigned to Dong Ha, stated that for his situation, he and his men were as prepared as well as they could be for what they experienced. Another, assigned to RED HORSE in Phu Cat, said his training had prepared him well for what he experienced.

There were no patterns in the responses from those with RED HORSE experience and responses from those with BCE experience in Vietnam. Nor was there any difference in pattern between officer and enlisted responses.

Desired Training

Question 38 asked "Was there any particular training you would have liked to have had before you got there?".

Paraphrased responses to this question are in Appendix M. The responses formed three main categories: (1) use of weapons and combat tactics; (2) what to expect; and (3) no other training was desired.

Eight responded that more training on weapons and combat tactics would have been desirable. Of the eight, four had been in RED HORSE squadrons. Of these four, two had joined RED HORSE mid-tour and had not received the training the rest of the squadron had received. Another RED HORSE respondent, who had been in World War II, noted that four or five members did not have a serious enough attitude toward combat. He suggested that an escape and evasion course may have impressed on them that combat was not a "party". The last respondent in this category was in the second RED HORSE unit sent into Vietnam. He stated several times during the interview that RED HORSE was expected to perform a Marine Corps role but was not given Marine Corps training. He suggested giving RED HORSE such training and commented that part of the RED HORSE mission is to build air bases in undeveloped areas. He emphasized that exposure to enemy attack is greatest during construction of the base (before Army combat troops are available to provide support), and that a base is easier to defend after it is operational. Due to the time frame (December 1965), this respondent did not receive the training that was later provided to RED HORSE units. A statement he made was echoed in several other interviews: due to the inadequacy of RED

HORSE combat training. if his unit had been exposed to a serious attack, the enemy would have routed them.

Four BCE personnel responded that increased weapons and combat tactics training is needed. Respondent number six wished he had received full combat training because he had no idea that as an Air Force member he would be expected to fight in combat. Because his duties as a Security Police augmentee involved him in direct fire fights with the enemy he stated that training on the variety of weapons that were available to U.S. forces in Vietnam would have been desirable. Respondent five commented that the squadron first sergeant in Vietnam had Marine Corps combat training and was thereby able to share helpful information on how to set up defensive positions and establish fields of fire.

In the second response category (what to expect in the combat zone), five respondents were in BCE units and one was in a RED HORSE unit. Basically, respondents expressed a desire to know more about the place and circumstances they were being sent to. Respondent number one stated that knowledge of what to expect takes the fear out of the unknown. Recommended areas for indoctrination included the living conditions, food, local populace and the effects of enemy weapons. In addition to these areas, respondent number two desired an understanding of the enemy's psychology in conducting war. Another stated that what to do in the worst possible situation (such as being overrun) was never explained. Respondent number nine noted that some people

became irrational when asked to work outside their normal job. Because of this, he felt it is important to get people used to working in areas they normally do not and to accustom them to thinking on their feet. And, as mentioned in a previous section, one respondent would have liked training on how to respond to incoming mortars and rockets.

Five respondents stated they were adequately prepared for what they experienced in Vietnam and that additional training was not needed. These five formed two categories: (1) three with training from a previous era or another service; and (2) two who felt additional preparation was simply not needed for the situation. In the first category, respondent number thirteen mentioned his Marine Corps training as fully adequate for his Vietnam experiences. Respondent number eight felt his training during the Korean War and the Army combat engineering training he had enrolled himself in had covered enough about weapons and combat tactics to prepare him adequately. However, he noted others were not prepared as well as he was for combat. This respondent made it clear he had always wanted to be an Air Force sergeant and as such appeared to have always had attitudes that were conducive to combat readiness. Respondent eleven said he simply did not think about combat. In the second category were two officers who had never experienced combat prior to Vietnam. One stated that more training was not needed because at that time, in those locations, and considering the threat, preparation of CE for combat in

Vietnam was adequate. The other officer felt that additional combat training would have only created anxiety in those being sent to Vietnam.

Finally, outside all the other categories, one respondent stated that first aid training would have been helpful in the situations he was in.

Initial Reaction to Enemy Attack

Paraphrased responses to question 18, "Think back to the first time you were under enemy attack, what was your initial reaction?" are contained in Appendix N. The responses formed five categories: (1) confusion; (2) fear; (3) feelings of urgency to do what was needed; (4) taking cover; and (5) a feeling of confidence or curiosity.

The most frequent response to question 18 was confusion over what was happening or what to do in the situation. Six respondents, all of them enlisted, and all but one from a BCE unit, answered in this category. Answers in this category were evenly split into two other categories: (1) did not know what was happening; and (2) did not know what to do. One respondent, a Staff Sergeant assigned to Phu Cat, commented that his whole tour in Vietnam was characterized by not knowing what was going on.

The next most frequent response to question 18 were feelings of fear. Of the five responses in this category, four were from enlisted interviewees. Respondent four noticed that the response to enemy attack in the BCE unit at

Pleiku was much less organized than the response in the RED HORSE unit at Phu Cat, where they took weapons and went to their defensive positions. This respondent also commented that he had not been told how to respond to incoming enemy mortars and rockets.

Three respondent answers involved feelings of urgency to do what was necessary. One person stated he wanted to get to his designated job so he could participate in the after-attack recovery actions.

Two respondents stated they took cover, while two others (both officers) stated they were confident during the attack. All four of these respondents were assigned to Cam Ranh Bay and Tuy Hoa air bases which, according to the interviewees, were protected by U.S. Army and Republic of Korea ground forces. One of these respondents stated his reaction was curiosity. He said that because rockets could not reach "RMK hill", people stood outside and watched the rocket attacks. "RMK hill" was the hill on base where the contractor combine Raymond, Morris, and Knudson was located.

Training and Perceptions of Preparedness

Paraphrased responses to question 3. 35 and 36 which deal with training and feelings of being prepared for combat are summarized in Appendix O. Responses from the seventeen interviews fell into three categories: (1) those who did not feel prepared for combat; (2) those who felt prepared for combat; (3) and those who did not give a definite response.

There were twelve responses in the first category: not being prepared for combat. Of these, eight were assigned to BCE units. Of these eight, seven had received only Basic or ROTC/OTS training. One of these seven served as a Security Police augmentee in serious fire fights with the enemy and was not prepared to be a combat soldier. Four of the twelve responses in this category were from former RED HORSE members. Of these four, two were assigned to their units out of cycle and therefore did not receive the sixty-day training the rest of the unit had received. One RED HORSE respondent had been in the second RED HORSE unit sent into Vietnam and consequently did not receive the extended contingency training which future units did. Another respondent had the sixty-day RED HORSE training as well as a combat tour with RED HORSE before being assigned to the BCE unit at Pleiku. He commented that at Pleiku he did not know how to respond to incoming mortars and rockets. As mentioned earlier, one respondent noted that although he was minimally prepared for combat, his training was adequate considering the low threat level he faced.

There were five respondents who felt prepared for combat. Of these five, two had previous combat experience: one of these indicated his previous experience was a significant factor in his feeling prepared for combat in a BCE unit. The other had been in RED HORSE and had served as an Military Policeman in World War II and had also been an escape and evasion instructor in 1958. This respondent felt

his attitudes, which he said are typical of people of his generation, better prepared him psychologically for the rigors of combat (another respondent who was approximately the same age also expressed this belief). Another RED HORSE member stated that because of his Marine Corps training he felt totally prepared for combat in Vietnam. One respondent mentioned that basic training during the Korean War era was more combat oriented than the basic training given during the Vietnam era; and consequently he felt he was better prepared than those around him. Another respondent who had been assigned to the BCE unit at Da Nang commented he felt "pretty good" about his preparation for combat (with basic training and technical schools only), but that neither he nor anyone else expected the to see as much hostile fire as they did (mortar and rocket attacks occurred at his location about once a week). The last respondent in this category stated his RED HORSE training (particularly the physical conditioning and fire team practice) adequately prepared him for the ambush and sniper fire his unit received.

Finally, one respondent did not believe it was possible for him to know if he was prepared for combat. Consequently, he would not say whether he did or did not feel prepared for combat. This respondent had been assigned to Dong Ha, a location that was exposed to heavy enemy activity.

The next chapter will use the results presented here and the information obtained through the literature review to answer the investigative questions posed in Chapter One.

V. Discussion

This chapter answers the investigative questions posed in the Introduction by using the information gathered through both the literature search and through the interviews with Civil Engineering combat veterans. The objectives of the investigative questions were to identify important aspects of the Vietnam combat experience for Civil Engineering personnel, to provide a basis on which to recommend future studies, and to develop tentative conclusions on how to better prepare for future conflicts.

Investigative Question 1

What kinds of ground combat situations did Air Force engineers encounter in Vietnam?

Civil Engineering personnel reported receiving hostile fire in the form of mortars, rockets, and small arms fire. Of the seventeen Vietnam combat veterans interviewed, fifty-eight percent classified enemy attacks as harassment fire, which they stated posed a minimal threat of damage. Other reasons given for categorizing enemy fire as harassment were the hit-and-run nature of attacks, enemy weapon inaccuracy, and attack timing (attacks were often initiated during early morning hours and on unexpected days). Forty-two percent described enemy attacks as very destructive. Six of the twelve BCE respondents and one of the six RED HORSE respondents answered in this category. An example of the destructive capability of enemy attacks was given by a

respondent who recalled a 122-MM enemy rocket striking a building in the Civil Engineering compound at Bien Hoa AB and killing ten people. He also reported that throughout his tour he felt a constant threat of being killed or seriously wounded by mortar or rocket fire.

Three factors appeared to have a bearing on the intensity and effectiveness of attacks: (1) location in country; (2) time period during the war; and (3) whether or not air base defense and combat patrols were provided by ground forces. Some interview participants, assigned to bases where combat patrols and air base defense were performed by U.S. Army (USA) or Republic of Korea (ROK) troops, reported lower enemy activity than respondents who had only the Security Police to defend them. This finding is consistent with the literature on army ground combat experiences which states that active ground combat patrols curtail enemy activity (McDonough, 1988:31).

Reports on the duration of enemy attacks covered a range from "a few minutes" to "all day". Northern bases such as Da Nang and Dong Ha (a radar site) received more vigorous enemy activity than well defended bases like Tuy Hoa and Cam Ranh Bay. As expected, respondents assigned during the Tet Offensive experienced increased attack frequency and intensity, with some respondents reporting continuous rocket and mortar attacks. Also, type of job made a difference in whether or not hostile fire was received. Those on convoy and those performing work on the

base perimeter (such as power linemen) were frequent targets for ambush and snipers.

Another aspect of the combat situation in Vietnam was whether or not fire was returned. Of those interviewed, six personally returned fire; six stated they received adequate protection from enemy attacks through USA, ROK or Security Police (SP) forces and did not have to personally return fire; and six answered that no one returned fire in any form (18 reports were recorded because respondent four provided information on two locations in Vietnam). One respondent mentioned specifically that the lack of ground defense support from the Army created the requirement for Civil Engineering personnel at Bien Hoa AB to assist the Security Police in severe fire fights. The two respondents who participated as SP augmentees both reported preferring this duty to inactivity in a bunker. Also, both were of low enlisted rank while in Vietnam. Engineers were sometimes required to perform work near the base perimeter during enemy attacks, and as such drew hostile fire. BCE and RED HORSE personnel both had to defend themselves from attack while off base. Convoys were reported to stop and return fire when under attack. Also, one respondent noted that the RED HORSE squadron at Phu Cat did receive protection from enemy attack through ROK combat patrols of the surrounding area.

Four of the six RED HORSE respondents interviewed stated they did not return fire. Reasons given were rules

of engagement restrictions and not knowing where to shoot.

The two RED HORSE respondents that returned fire did so while on convoy duty. Respondent six noted that many American lives were lost because of rules of engagement restrictions on returning fire.

Clear cut differences between RED HORSE and BCE experiences of hostile fire were hard to identify because RED HORSE personnel often served in many places during one tour. The variety of locations in which RED HORSE respondents had combat experiences made it difficult to determine which experiences occurred while assigned to main operating bases and which applied to assignments in remote detachments. However, a general impression from the interviews and from the literature indicated the nature of the RED HORSE mission exposed them more frequently to sniper and ambush fire than BCE personnel, for whom mortar and rocket fire were more common. However, there were cases of BCE personnel being ambushed when working off base, as well as instances where RED HORSE personnel received mortar and rocket fire.

An important aspect of the combat situation which Americans faced in Vietnam was that the enemy and local citizens looked and dressed so much alike that it was nearly impossible to tell them apart (Karnow, 1983:434). In the interviews, it was noted that trucks and heavy equipment were booby trapped by Viet Cong who were inadvertently hired to work on the base. One respondent stated that a

Vietnamese base barber was discovered to have been assembling rockets after work for use against the base.

Investigative Question 2

What are the major behavioral dimensions which influence effectiveness in ground combat?

This question was answered from a review of the literature on behavior in combat. The dimensions identified by the literature were: (1) combat motivation (or the willingness to fight); (2) cohesion; (3) morale; and (4) leadership. The four dimensions identified will be used as a framework to further describe the Civil Engineering combat experience in Vietnam. Because there were no studies on the human element in Civil Engineering in Vietnam found through the review of the literature, this section relies on the information obtained through the experience interviews.

Combat Motivation. Combat motivations which were described during the interviews were: (1) self-preservation; (2) discipline; (3) hate; and (4) the primary group. The motivations of bonding with the unit, ideology and voluntary compliance did not surface as respondent motivations to fight.

Self-Preservation. A recurring factor in the accounts of those who came under heavy fire was the desire to survive. Respondent six, in describing his experiences as a Security Police augmentee during the Tet Offensive, indirectly identified self-preservation as a motive to fight by stating fire fights with the enemy boiled down to "it was

us against them and they weren't going to leave". He mentioned that air strikes could not be launched against the enemy because enemy attacks had damaged the runway. Also, because the Army was not available to provide air base defense, the base had to rely on its own small perimeter defense teams to prevent enemy infiltration. As a consequence this respondent reported there were no suitable alternatives in the situation except to fight.

Discipline. In addition to self-preservation, the motivation of discipline (fear of formal authority) appeared to operate in some combat situations. Two respondents said they would have preferred to have not been in Vietnam but that there was simply no way to get out of the situation except by completing the tour, being severely wounded, or being killed. However, respondents seven, eight, nine, and fifteen did recall people who left Vietnam early or were placed in positions of safety within the organization because they "cracked up" or were under too much stress to perform their job.

Hatred. Another motivation experienced by Civil Engineering personnel in combat was hatred. For example, respondent number six recalled that "the craziness [of the situation] forms into a pointed hatred". Other respondents remembered experiencing attitudes of hatred and anger when enemy attacks killed their friends. Respondent seventeen recalled many people being deeply angered by an enemy attack on an Army hospital at Cam Ranh Bay. An important point to

bear in mind is that many CE personnel did not return fire, and as such did not have the opportunity to experience and report hatred as a motivation to fight in combat.

Primary Groups. Upon analyzing the interview results it became apparent that questions which would identify details of primary groups were not included in the interview questionnaire. Consequently, this study did not directly obtain information on Civil Engineering primary group dynamics in the combat zone. However, as a general comment, because most of the respondents were not subject to conditions of intense combat, close bonds within small groups of people for moral support may not have been typical. This is consistent with findings from the literature which state that intense bonding within small groups is more characteristic of units in active combat than it is in the rear areas (Wesbrook, 1980:257). Based on the interview findings, most group relationships within the BCE and RED HORSE squadrons appeared to result from living and working together on a daily basis as opposed to the "stress of combat" or combat conditions. One exception to this was the respondent at Dong Ha who stated that a "brotherhood" developed among the people at his location because of the exposure to intense, extended enemy attacks. This was the only mention of close relationships due to being under combat conditions.

Though "voluntary compliance" was listed in the literature as an important motivation to fight, the interviews did

not reveal it to be a common motivation for Civil Engineering personnel. And although some respondents recalled Civil Engineering commanders who were exceptional leaders, their leadership was not cited as a motivation for fighting. However, when voluntary compliance is viewed as doing something simply because it is perceived to be right, one other interview comment falls into this category: a respondent reported voluntarily exposing himself to hostile fire by leaving his bunker during an attack so he could render aid to someone outside the bunker.

The combat motivations of "ideology" and "bonding with the military unit" were not specifically addressed in the interview questions, nor did the responses to open-ended interview questions reveal them as motivations to fight.

Cohesion. In the discussion that follows, responses to interview questions about unit cohesion were categorized by the researcher as "excellent", "good", etc. Ratings were based on respondent wording as well as respondent tone of voice during response. Interpretation by the researcher was needed because interview questions were open-ended; that is, respondents were not provided an "Excellent" to "Poor" scale against which to rate cohesion.

Five of the twelve BCE respondents rated cohesion in BCE units as excellent; whereas all six RED HORSE respondents rated cohesion in RED HORSE units as excellent. A consistent theme of belonging to and identification with the unit was present with RED HORSE respondents.

BCE units in which cohesion was rated as excellent appeared to do a lot of things together. These things included playing team sports and having frequent parties. Additionally, intensive enemy attacks, the need for unit members to depend on each other to get the job done, and having a lot of work to do also appeared to be related to high cohesion. These observations are consistent with two of the requirements for unit cohesion identified in the literature: frequent interaction among unit members and having a mission to perform.

From the interviews, several factors were identified as opposing the development of cohesion in BCE units. They were: (1) the lack of contingency training before the tour; (2) feelings of not having a real purpose in Vietnam; and (3) poor decisions and a lack of experience on the part of leadership. One respondent who had been in a RED HORSE squadron in Vietnam before being assigned to a BCE unit indicated there was a vast difference in cohesion between the two units; he consequently rated cohesion in the BCE unit at Pleiku as poor.

A comparison between ratings for unit cohesion and unit leadership did not reveal a consistent relationship (Appendix I). Although this was inconsistent with the literature (which indicates cohesion is usually related to the quality of leadership), the purpose of this study and the general design of the interview questionnaire limited the ability to

apply firm percentages to relationships between different variables.

Factors reported to account for the high cohesion in RED HORSE units were the feeling of having an important mission to perform, being trained together for sixty days, unit rotation into and out of the combat zone (like German units in World War II), and seeing and working with each other frequently during the day.

Leadership. Based on the interview responses, the quality of leadership in Civil Engineering units in Vietnam appeared to be inconsistent. Some squadron commanders were highly praised and had the respect and loyalty of entire units, while other commanders performed so poorly they were removed from their positions before the end of their tours. Interview responses did not indicate a consistent distinction between the quality of leadership in BCE units and that in RED HORSE squadrons.

While many respondents had a positive opinion of the quality of unit leadership, very few offered specific positive comments. The comments that were provided indicated good leaders were aware of the situation they were in, had a conscientious attitude toward what they were doing, and showed a willingness to support their subordinates. Specific negative comments significantly outnumbered positive comments. Negative comments about leadership revealed: (1) some leaders did not know what they wanted; (2) some lacked common sense; (3) younger officers were obviously

inexperienced; (4) many officers were unwilling to ask the advice of NCOs; (5) because of the lack of technical skills, higher ranking enlisted personnel sometimes worked for those of lower rank; and (6) privileged sleeping arrangements, judged harmful to unit cohesion by respondents, existed for enlisted personnel and were based on rank and position in the organization.

Evaluations of junior officers in engineering units varied from "excellent" to "young and inexperienced". Only one specific positive comment was offered about a junior officer: he led by example and showed his troops exactly what he wanted to have done. Negative comments about the leadership of junior officers concerned their not being trained or experienced in leadership, and that consequently they did not know what to do in combat situations.

Comments about leadership in the enlisted ranks, although not all negative, tended to indicate they lacked expertise due to having civilian supervisors in previous assignments or because they had recently been cross-trained. It was noted that those who had been cross-trained lacked the experience needed to provide effective leadership and supervision. Because interview questions were not designed to identify the quality of leadership among the different ranks, evaluations of the quality of leadership were qualitative and general.

Specific comments about desired leadership traits (Appendix H) were too numerous to list here. However, three

requirements for effective leadership were identified by several respondents: (1) superior job knowledge; (2) decisiveness; and (3) an ability to make the right decision without a lot of information.

Morale. The literature highlighted morale as the most vague of the four behavioral dimensions of combat effectiveness. Experts in the field of combat behavior classify morale as a component of the combat motivation theory "bonding with the unit" (Ballard, 1989; Gal, 1986:560). And because morale was also identified in the literature as closely tied to unit cohesion (already discussed), this section of the discussion will simply identify a few factors that were considered helpful by Civil Engineering personnel in getting through tours in Vietnam.

In response to the questions "What things helped you get through the tour?" and "Were there things that kept you going when times got tough?" the most commonly reported factor was work. Fourteen of the seventeen respondents identified this factor as helpful in getting through the tour. Other factors consistently mentioned, but with less frequency, were: (1) support from home; (2) friendships; (3) anticipation of the tour's end; and (4) religion.

A vast majority of both the BCE and RED HORSE respondents indicated boredom was not a problem. Also ten of twelve respondents who took leave or "R and R" found it helpful in getting through their tour (See Appendix P).

Investigative Question 3

What major problems were encountered in the Vietnam combat zone?

Five separate problems were identified by the literature review and the interviews with combat veterans. They were:

1. Insufficient combat training
2. The lack of resources
3. Insufficient technical training
4. The lack of security from hostile fire
5. Unexpected circumstances and unscheduled activities

Insufficient combat training was not a problem documented in the literature. Following is a discussion of each identified problem.

Insufficient Combat Training. This was the problem most frequently identified during the interviews. Six respondents identified insufficient combat training when asked "In your opinion, what's the biggest problem faced by Civil Engineering in a combat zone?". Four of these six had been assigned to RED HORSE units, the other two had been in BCE units. Two specific problems were identified in this category:

1. Lack of familiarity with weapons and combat tactics
2. Officers and NCOs not knowing what to do in combat situations

An important theme in the responses was the need for the Air Force to provide training on combat weapons and tactics to members who are expected to fight in combat.

Several respondents indicated they would have been better prepared for and more confident in their combat experiences had they received more combat training (See Appendices L, M, and O). Another factor revealed by several respondents was that people in BCE units were not informed on how to respond to enemy attacks. A few said they expected to be assigned to a rear area and as such did not expect to be in combat. Though the literature did describe the training given to RED HORSE and Prime BEEF personnel, no sources were found which indicated BCE personnel were given combat training beyond familiarization with the M-16. One respondent emphasized the contrast between the harassment fire of the Vietnam Conflict and the destructive and psychologically terrifying weaponry that is available today for future conflicts. He emphasized this contrast to suggest that today's combat training should prepare CE personnel for anticipated environments. The literature confirmed this respondent's opinion on the nature of future conflicts.

The second aspect of insufficient combat training concerned officers and NCOs not having practical experience or training for the tasks required in Vietnam. Respondent eight mentioned he frequently heard officers and NCOs say "tell us what to do" concerning contingency tasks in Vietnam. In his opinion, this situation existed because the attitudes and type of work performed in the U.S. did not orient military personnel toward tasks required in combat. He also commented that a consequence of being unfamiliar

with required tasks was that many officers and NCOs could not provide good leadership. The fact that good leadership requires skill in military tasks was well established in the literature (see Grinker and Spiegel, 1945:46). A partial list of combat engineering skills he found useful in Vietnam were:

1. Road construction
2. Bridge construction
3. Installation and repair of temporary runway materials
4. Knowledge of soil engineering
5. Positioning of troops to secure critical facilities from enemy attack
6. Swamp drainage

Lack Of Resources. A second problem identified in both the interviews and the literature was the lack of resources in Vietnam. The different aspects of this problem were:

1. A lack of established manpower requirements
2. An inadequate supply system
3. A lack of required heavy equipment
4. Problems with utilities

The literature identified the fact that taskings levied on Civil Engineering squadrons in Vietnam rapidly grew in spite of a lack of resources to satisfy them. One of these resources was manpower. The literature showed that by 1967, the Air Force had still not developed BCE unit manpower requirements which considered factors like base population, number of assigned aircraft, and the condition of base

facilities. The interviews may have identified this factor indirectly by emphasizing the tremendous workloads in Vietnam. The literature, however, did not report RED HORSE to have experienced significant manpower problems.

A "push" type of supply system was used in Vietnam. This sent tons of un requisitioned materials from the United States in the hope that what was sent was needed. However, many items that were needed were not provided and many items that were sent were never used (Mayes, 1967:2). The supply of parts for the many different types and brands of portable generators was a particularly acute problem in Vietnam (Torr, 1964:71). There was also an inadequate supply of parts for heavy equipment maintenance.

BCE and RED HORSE units were both subjected to material shortages. However, the literature indicated RED HORSE material availability problems were eventually overcome through a program of coordinated shipments of specially monitored bills of materials (Corona, 1970:249). Several respondents confirmed that supplies were a considerable problem.

Also, the literature indicated that heavy equipment in BCE organizations in Vietnam was often in disrepair and in short supply, thereby limiting the amount of work that could be accomplished by BCE organizations and TDY Prime BEEF teams (Corona, 1970:243). Respondent three stressed the importance of Prime BEEF teams and host BCE organizations

having the required equipment and tools to perform their missions.

A fourth resource problem that was identified through the literature review but not in the interviews, involved problems with utilities, particularly electrical power and potable water. Because much of the deployed U.S. equipment required 60-cycle power, the limited 50-cycle power that was available in Vietnam presented compatibility problems (Torr, 1964:71). Consequently, Civil Engineering relied on portable generators to provide electricity. Also, since many bases did not have nearby sources of potable water and because travel to them was unsafe (due to the threat of ambush), over 300 wells were drilled on Vietnamese bases to meet this need (Lau, 1968:10).

Insufficient Technical Training. Both the literature review and responses to interview questions stated that CE craftsmen and supervisors lacked the skills needed in Vietnam. The subordination of military personnel to civilian supervisors in the United States reportedly hurt CE supervisory and technical capability in Vietnam (Englebach, 1965:3). Another problem identified through the interviews was some military craftsmen expressed reluctance or a lack of confidence to work in areas outside their specialty. Respondent nine, an active duty Chief Master Sergeant, noted the ability and willingness to work outside one's specialty, though essential in combat, is not fostered in CE organizations today. Another respondent mentioned that technical

courses were not as effective as they needed to be and that learning in the classroom was not as effective as learning in the field. He suggested that portions of classroom training be conducted in the field to familiarize technicians with the variety of conditions encountered in combat. The literature review also identified training in replacement rather than in repair as contributing to the lack of skills in Vietnam (Waggoner, 1985:207-209).

Another aspect of insufficient technical training was described by respondent thirteen. He noted that members on his Prime BEEF team (in September 1965) had not been trained on how to construct new facilities. Also, of the eighteen-person team, only two members had the skills needed to accomplish their assigned mission. This respondent cited subordination to civilian craftsmen and military personnel being trained only in repair and not in the construction of new facilities as the reason for this situation.

Another problem related to CE craftsmen having insufficient training was the fact that much of the labor used in Vietnam was hired from the local market. South Vietnamese laborers were generally unskilled and, once trained, left the air bases for higher paying work elsewhere. The literature review also revealed that the 12-month tour limited the level of skill in BCE units by rotating craftsmen back to the U.S. shortly after they were fully trained. Consequently, BCE's were continually subjected to partially capable work forces (Waggoner, 1985:207-209).

Security From Hostile Fire. Interview respondents two and fifteen identified security from hostile fire as the biggest problem they faced in combat. A point of interest in this area was that although enemy attacks were significant and vivid experiences for several respondents, the literature on CE involvement in Vietnam barely touched on problems associated with hostile fire. The vast majority of the literature reviewed discussed either the technical aspects of the work or Civil Engineering's accomplishments during the war.

Unexpected And Unscheduled Activities. Respondents seven and twelve considered the unpredictable nature of war as CE's biggest problem in combat. Both were officers currently on active duty and both had served with BCE units in Vietnam. One of the officers commented that work in the combat zone was characterized by increased urgency, and that work was done much less systematically than in peacetime. Carl Von Clausewitz' description of war as an environment characterized by "friction" supports this view. Clausewitz also believed it is important to familiarize soldiers with at least some of the danger, confusion and stress involved in war before sending them into combat (Jolles, 1950:53.56). The literature confirmed the unexpected and unscheduled nature of activities Civil Engineering personnel experienced by stating that in nearly every aspect of daily operations, Civil Engineering personnel had to contend with problems

that were foreign to bases in the United States (Torr, 1964:64).

Investigative Question 4

During the Vietnam War, how could the Air Force have better prepared Civil Engineering personnel for combat?

Because the literature review did not reveal any lessons-learned reports on the combat aspects of CE assignments in Vietnam, interview respondents were asked questions on how their preparation for combat could have been better. Appendices L, M, N, and O contain the paraphrased responses to these questions.

Several facts were revealed by the interviews and the literature concerning the preparation RED HORSE and Prime BEEF personnel received. A consistent finding from the interviews was that the only combat training provided to Base Civil Engineering personnel in Vietnam was on the M-16 rifle. However, one respondent did reveal that those who served as Security Police augmentees did receive additional training in Vietnam on the weapons used by the Security Police, such as the M-60 machine gun. In contrast, RED HORSE personnel were trained as a unit for sixty days on contingency tasks and combat tactics before being sent to Vietnam. They were also rotated into and out of Vietnam as a unit.

Analysis of responses to several questions (particularly question sixteen) revealed five general recommendations

interviewees had on how preparation for combat in Vietnam could have been better. The recommendations were:

1. Provide realistic contingency training
2. Indoctrinate on what to expect
3. Ensure adequate tools and equipment are provided
4. Provide better technical training
5. All preparation was considered adequate

The following discussion provides the significant details of each recommendation.

Realistic Contingency Training. Twelve of seventeen responses to Question 16 "Do you have any ideas on how we can better prepare CE troops for operations in a combat zone?" fell into this category. Seven of these responses were from those who had worked in BCE organizations, the other five were from former RED HORSE members. Actual recommendations and the rationale for them included:

Using Combat Veterans In Contingency Training. The thrust here was that effective combat and contingency training requires instructors with combat experience.

Realistic Training Environment. Several recommendations were made to increase the realism of training. Among these were: (1) exposing Civil Engineering personnel to combat conditions such as those that are well simulated in Army combat courses; (2) testing Prime BEEF teams by providing them a mission away from the home station; (3) informing people on what could happen in modern combat zones

and how to respond to those situations; and (4) testing CE personnel's ability to think on their feet and perform tasks in specialties outside their own.

Several important reasons were offered for increasing training realism. These were: (1) two RED HORSE respondents commented they doubted their units could have survived a serious encounter with the enemy in Vietnam because of the lack of realistic training; (2) a recurring theme in the interviews was that both BCE and RED HORSE personnel were tasked to perform a role that was assumed to belong with the Security Police or the Army; (3) some respondents have observed a tendency for people to not take contingency training seriously enough.

Security Police-Trained CE Personnel. The rationale here was that a few people in a Civil Engineering unit with Security Police training on defensive positions, patrolling, and convoying would be valuable in situations where many do not know how to do these things. One respondent remembered that the squadron first sergeant had received Marine Corps training and was thereby able to advise others on setting up defensive positions.

Familiarization With Enemy Weapons. This recommendation came from a respondent who had a RED HORSE assignment prior to being assigned to a BCE unit. He stated he was totally unprepared to respond to incoming rockets and mortars because he was unfamiliar with their sounds and destructive capability. Several BCE respondents reported

they were uninformed on how to respond to enemy attacks, particularly the first time they were encountered.

Related to this recommendation was that in response to question 18, "Think back to the first time you were under enemy attack, what was your initial reaction?", six of the seventeen respondents stated they were confused about what was happening and did not know what to do. Of these six, five were BCE personnel. The one RED HORSE respondent in had been sent to Vietnam before an organized RED HORSE training program had been started. In general, RED HORSE training and unit rotation appeared to better prepare respondents on what to do when attacked. However, the fact that two RED HORSE respondents had either been in combat in World War II or had previous Marine Corps training, limits the ability to say that all RED HORSE respondents were better prepared for combat because of their training.

Training On Use Of Weapons And Combat Tactics.

This recommendation, mentioned in the third investigative question, involves providing combat training to Air Force personnel who are expected to fight in combat. The lack of Army support and a limited number of Security Police personnel exposed some CE personnel to a direct combat role.

Indoctrinate On What To Expect. The second recommendation category was to provide information on the country and the situation. Respondents from BCE and RED HORSE units both expressed this desire. Two respondents mentioned they had no idea of what they were getting into when they were

sent to Vietnam. Another respondent mentioned there were a lot of people who encountered more hostile fire than they expected to. A list of things the Air Force should consider in sending people to the combat zone follows:

1. The social environment
2. In-country customs
3. In-country personnel problems
4. Supply and equipment problems
5. Types of food available
6. Living conditions and in-country hazards
7. Enemy psychology in conducting the war
8. Reason for being in the country

A point made during the interviews was that having some idea of the factors involved in the combat situation would reduce the anxiety about an unfamiliar experience. It was also suggested that indoctrination on the equipment and material supply problems in Vietnam would have better prepared people for their tours.

Somewhat related to this recommendation category was preparation of contingency plans in advance of deployment. Respondent fifteen mentioned having to write an alert plan while in the combat zone.

Adequate Tools And Equipment. When asked how CE can be better prepared for operations in combat, respondent three cited the need for the Air Force to provide the right quantity and type of tools in Prime BEEF deployment packages to accomplish their mission. Problems Civil Engineering

units had with tools and equipment were already discussed in this chapter under Investigative Question 3.

Better Technical Training. Respondent number ten identified better technical training of military craftsmen "on the fundamentals" of their trade as a way to improve CE combat preparation. This recommendation also was addressed under Investigative Question 3.

Preparation Was Considered Adequate. Responses to questions 37 and 38 "What aspects of the combat experience would you have liked to have known about before you got there?" and "Was there any particular training you would have liked to have had before you got there?" identified the fact that four respondents considered their preparation for combat in Vietnam to have been adequate. An interesting opinion expressed was that for the period of time, and the bases involved, more combat preparation was unnecessary and could possibly have produced more anxiety than it would have been worth.

This chapter answered the investigative questions from information obtained through the literature review and the interviews. The next chapter will provide conclusions on what the significant aspects of combat were and recommendations for further study.

VI. Conclusions And Recommendations

This chapter presents conclusions based on Chapter Five's answers to the study's four investigative questions. Conclusions and recommendations are presented for the study's two objectives: (1) to identify significant aspects of combat experienced by Air Force Civil Engineering personnel in Vietnam; and (2) to identify questions which future research should consider in determining how to better prepare CE personnel for combat.

Conclusions

Research Objective One.

To identify significant aspects of combat experienced by Air Force Civil Engineering personnel in Vietnam.

Several aspects of the Civil Engineering combat experience were identified through the literature review and the interviews. The purpose of this section is to provide a concise statement of the most significant of those aspects. For this research, a "significant" aspect is defined as one that is potentially representative of what many Civil Engineering and RED HORSE units experienced in Vietnam. The following criteria were used to identify significant aspects: (1) two or more interview respondents identify the same aspect; (2) one respondent (or more) identifies an aspect that was confirmed in the literature.

Of all the aspects of combat discussed in Chapter Five, the following thirteen were identified by the researcher as

significant and deserving of consideration in preparing Air Force Civil Engineering personnel for combat in future conflicts. Subparagraphs entitled "Reason For Significance" briefly describe why each aspect met the criteria for significance. The reader is reminded that because of the small sample size and because the purpose of the research was exploratory, conclusions presented here are tentative.

1. Combat experiences in BCE units were widely varied and appeared to depend on the location, time frame and the availability of combat troop support in Vietnam.

Reason For Significance: Some respondents indicated they were prepared for what they experienced while others stated they were not prepared.

2. Junior officers in BCE units lacked essential combat engineering skills.

Reason For Significance: Respondents six, eight and thirteen reported this problem. The literature confirmed this as a problem for enlisted personnel, but not for officers. This problem was not reported for RED HORSE units.

3. Some Base Civil Engineering personnel did succumb to psychiatric stress in Vietnam.

Reason For Significance: Reported by respondents seven, eight, nine and thirteen.

4. BCE personnel encountered problems that were totally different from problems that characterized U.S. bases.

Reason For Significance: Respondents seven and twelve reported this observation, and the literature was in agreement.

5. BCE units experienced shortages in tools, heavy equipment and construction materials.

Reason For Significance: Respondents six, eleven reported supply shortages; respondent three reported equipment and tool shortages. The literature confirmed both observations.

6. Having many different types of portable electric generators in Vietnam made adequate supplies of generator parts difficult to maintain.

Reason For Significance: Respondent ten and the literature reported this situation.

7. Subordination of military craftsmen and NCOs to civilian supervisors degraded BCE supervisory and technical capabilities in Vietnam.

Reason For Significance: Identified by respondents six, eight, ten and thirteen as well as the literature. Was not reported for RED HORSE units.

8. Personnel in BCE units were not been informed on the potential for enemy attack against the base, nor were they told how to respond to different attack scenarios.

Reason For Significance: Respondents one, four, six, and ten stated they were surprised or confused at their first exposure to enemy attack, however they did adjust to attacks quickly. Respondents one and four indicated that at no time during their tours were they informed on what to do in the event potential dangers to the base (such as being overrun) became a reality.

9. In general, BCE and RED HORSE personnel appeared to have been uninformed about life in the combat zone.

Reason For Significance: Respondents two, four, and fourteen, reported this as a problem. The reviewed literature did not identify this problem. Respondents ten, six and others mentioned enemy fire was encountered more often and was of greater intensity than they expected.

10. In general, many Base Civil Engineering personnel felt unprepared for combat in Vietnam.

Reason For Significance: Seven of twelve BCE respondents indicated they felt unprepared for combat.

11. In both RED HORSE and BCE units, some Civil Engineering personnel directly participated in combat.

Reason For Significance: Interview respondents from both types of units reported personally returning fire (see Appendix E). Again, the degree of reported involvement varied among respondents.

12. Cohesion and morale in RED HORSE units in general was excellent.

Reason For Significance: All six RED HORSE respondents rated unit cohesion as excellent. There were no RED HORSE respondents who indicated they felt a lack of purpose in Vietnam. The literature confirmed RED HORSE morale as generally excellent.

13. Having BCE personnel trained in more than one skill would have been desirable.

Reason For Significance: Respondents four and nine recommended this.

Recommendations

Research Objective Two.

To identify questions which future research should consider in determining how to better prepare CE personnel for combat.

The following questions were identified during this study and are recommended for future research on how to better prepare Civil Engineering personnel for their wartime role.

1. How has contingency training changed in Civil Engineering (CE) since the end of the Vietnam War?
2. What types of enemy ordinance are Air Force engineering personnel likely to encounter in future conflicts? Is CE being trained on how to deal with these weapons?

3. Are junior officers in CE developing the skills they will need in war?
4. Do junior officers understand the tasks they will be expected to perform in combat?
5. Do NCOs understand the tasks they will be expected to perform in combat?
6. How will the Air Force deal with the problem of providing electrical power in future conflicts? Has the Air Force standardized its portable generators so as to facilitate supply of parts and to ensure the proper type of generator (emergency generators with high-speed engines versus generators designed to be sources of primary power (see Torr, 1964:71)) is provided?
7. To what extent do AFCE personnel need to be able to work outside their own specialties? What specialties should be familiar with what other specialties?
8. What information does the Air Force plan to provide CE personnel about their mission before sending them into combat?
9. What information should the Air Force provide Civil Engineering personnel on what they can expect to encounter in combat (such as combat stress and psychiatric casualties).
10. A larger sample of RED HORSE personnel is needed to determine how well prepared RED HORSE was for combat in Vietnam. There were too many confounds (such as personnel being rotated out of cycle into the unit) to reach even a tentative conclusion on the adequacy of preparation of RED HORSE units for combat.

Time did not permit the analysis of all the areas on which potentially valuable information was gathered during the interviews. Some of these areas were: (1) the use of alcohol; (2) sources of information available before the tour in Vietnam; (3) the amount of sleep loss; (4) reactions to combat losses; and (5) differences between CE operations in the combat zone and those back in the United States.

Rewording Questions. The following are recommended changes to the interview questions. The number before each change is the interview question number. These changes are suggested in order to improve the quality of information obtained through the interviews and to make comparison of responses easier.

3. Before asking this question, ask "What kind of military combat training did you have?". This will obtain more information on the respondent's combat training background.

7. Reword to find out if respondents heard or read anything about coming under hostile fire.

11b. Too vague. Be specific about the type of information sought through this question. For the Civil Engineering interviews, it would have been better to have asked "About how many people were assigned?"

15. Ask why respondent considered his/her response a problem.

17d. Reword to read "How effective were enemy attacks?". This should give a better idea of the respondent's impression of the destructiveness of enemy attacks. Because the purpose of this interview was to understand the respondent's experience in combat, the reworded question gives a better feeling for how the respondent perceived enemy attacks.

18. Reword to obtain information on the respondent's first attack in Vietnam. One respondent gave his initial reactions to hostile fire in World War II.

28. Provide respondent a short definition of "cohesion" before asking this question. Use a one-to-five scale to make comparison among responses easier.

29. Reword to determine more specific feelings of community and pride in unit accomplishments (Wesbrook, 1980:253). Also, reword "Please explain your relationship?" to read "Why did you have a close relationship?"

30. "How were they associated?" is too stilted a question for purposes of this interview. Recommend asking "What kind of groups were they?" or "Why do you think they chose to hang out with those groups?"

53. This question would be more purposeful if asked "What didn't you see in the leadership that you would like to have seen?"

Additional Questions.

1. When asked "Is there anything else I ought to be asking people on this subject?" two respondents recommended asking what happened to them when they came back to the United States.

2. Two respondents suggested asking whether or not they would do it again.

Interview Administration. In performing telephone interviews, use of a high-quality telephone recording adapter is recommended to avoid problems with static in the recordings. Also, in-person interviews are recommended, if at all possible. The literature was correct in stating that, generally, more cooperation is obtained through personal interviews than through telephone interviews.

Although, three of the telephone interviews performed during this research went extremely well and did provide the special insight required for this study.

Research Contributions

In addition to providing recommendations for future research, this study preserved some of the Civil Engineering combat experiences from the Vietnam War. Based on these experiences, a brief description of the "average" Civil Engineering combat experience in Vietnam would certainly emphasize the following characteristics: tremendous work-loads, constant stress, fatigue, material and equipment shortages, the demand for people who know their jobs inside

and out, oppressive heat and humidity, as well as anxiety over when and where the enemy is likely to strike.

Also, this study approached the CE Vietnam experience from a perspective that differed from the articles and previous research that were reviewed. Much of this literature was confined to the opinions of CE personnel who had been in command positions and concerned CE accomplishments and technical problems. In contrast, this study gathered information from "men in the trenches" on what combat was like in Civil Engineering. In the researcher's opinion, this study identified three general areas of today's combat preparation of CE personnel which are likely to require improvement.

The first area concerns the fact that CE personnel are subject to direct participation in combat. Because it is Air Force policy for CE personnel to assist the Security Police in the defense of air installations, training in fire team tactics and in the use of weapons available to Security Police forces should be given to CE personnel. This training would probably increase the confidence of CE personnel in their warfighting skills and may also encourage the warrior spirit and commitment to military values that is currently sought by the Air Force.

Second, the Air Force should develop doctrine on the type of information its people should have before being sent into a combat area. This study's findings indicate that Civil Engineering personnel in Vietnam would have preferred

to have received information on what they encountered in Vietnam instead of having to find out first hand. It seems obvious that providing information to people about an unfamiliar situation will reduce anxiety and enable them to better prepare themselves for what they will experience.

Third, in the researcher's opinion, an evaluation is needed to determine if CE officers and NCOs are developing skills required to satisfactorily perform their combat engineering role. The Air Force peacetime mission and organizational structure appear to discourage development of these skills.

In conclusion, the overall contribution made by this research was the identification of some significant aspects of the Civil Engineering combat experience during the Vietnam War. Methodologically stronger research, using larger sample sizes is required to verify the conclusions presented in this report and to identify reliable and cost-effective methods of improving Air Force Civil Engineering combat preparation. Future studies which determine whether or not problems encountered during the Vietnam War exist in the Air Force today and which identify ways to correct these problems will place CE in a better position to prepare itself for future conflicts.

Appendix A: Interview Questions

Entry Into The Combat Arena

1. Why did you join the Air Force?
2. Did you go through OTS, ROTC or the Academy?
3. Before Vietnam, what kind of military training did you have?
4. What assignments did you have before being assigned to Vietnam?
5. Were you a volunteer for South East Asia (SEA)?

Yes - Why did you volunteer?

No - How did you feel about it?

6. Before going to SEA, what did you hear about Air Force engineering jobs over there?

How did you hear about them?

7. Did you hear anything about coming under fire in Vietnam?

How did you hear about it?

8. When (month and year) did you arrive in SEA?

9. Where were you assigned?

10. For my records, how old were you when you got there?

What was your rank?

11. I'd like to get an idea of the type of unit you were assigned to.
 - a. In general, what was its mission?
 - b. How large was it?
 - c. How was it organized?

12. What was your job in Vietnam?

13. What was a typical day like for you?

14. Were there any big differences in getting the job done over there compared with typical stateside operations?

15. In your opinion, what's the biggest problem faced by Civil Engineering in a combat zone?
16. Do you have any ideas on how we can better prepare CE troops for operations in a combat zone?
17. You have already told me you came under fire, now I'd like to ask you some questions about that, if I may. How often were you exposed to enemy fire?
 - a. What kind was it?
 - b. Were you able to return fire?
If so, how?
 - c. Did anybody return fire?
If so, how?
 - d. What kind of damage did the enemy do in these attacks?
 - e. How long did these attacks last?
18. Think back to the first time you were under enemy attack, what was your initial reaction?
19. Had you ever thought about being under attack?
20. Was anything about the experience really different from what you had heard or anticipated?
21. What was your reaction to being fired upon?
(If questioned - What's it like to know someone's trying to kill you?)
22. How did those around you react?
23. As the tour went on, how did people adjust to being fired upon?

Established In The System

24. Now, I'd like to ask about your day-to-day life in the combat zone. What things helped you to get through the tour?
25. Were there things that kept you going when times got tough?

Yes - What were they, if you don't mind?

26. Were there ever times when you just didn't feel like doing your job?

Yes - What did you do?

27. Did you have any additional duties?

Yes - How did you feel about them?

28. Now, I'd like to learn a little more about the unit you were in. How would you rate the cohesion in your unit?

29. Did you have a close association with the unit as a whole?

No - Were there other groups within the unit that you had closer ties with?

Yes - Please explain your relationship.

30. Were there other groups that guys hung out with?

Yes - How were they associated?

31. Were there any loners?

Yes - Was there anything that made them different from anybody else in the unit?

32. How about the new guys? How were they welcomed into the unit?

33. When did you first really feel part of the group?

34. During your tour, were there any combat losses from your unit?

Yes - a. How did the group react to the losses?

b. How did people respond individually?

The Experience of Combat

35. Now, I'd like to ask some questions about your actual combat experiences. First of all, how well did you feel prepared for combat?

36. Did you receive any military training on what to expect, in combat and how to deal with what you would experience?

37. What aspects of the combat experience would you have liked to have known about before you got there?

38. Was there any particular training you would have liked to have had before you got there?
39. Was there any particular training you received in preparation for your combat tour you found helpful?
40. What was the best advice you were ever given about combat?
41. What was the worst?
42. Among all your combat experiences, choose one and tell me about it.
43. While you were over there, did people think about being wounded, killed or becoming a POW?
44. Did your friends share any thoughts about these concerns?

Yes - How did they feel about them?

No - Were these areas of discussion taboo?

Side Effects of Combat

45. This next portion of the interview deals with the physical effects of combat. Was one day more strenuous than another?
Yes - What was your toughest day like?
46. Did you ever have to go without sleep?
Yes - a. What's the longest you ever had to go without sleep?
b. Did you ever notice any side effects from lack of sleep?
47. What did you do in your free time?

What did you do to relax?

Was boredom ever a problem?

Did you take any leave while you were over there?

Yes - How did you feel about the leave afterwards, was it helpful or not?

48. Were there ever times you saw others not up to the task?

Yes - a. Did this affect the how they did their job?
b. How did the other guys feel about it?
c. Was there any time you saw someone overcome by physical or emotional stress to the point they couldn't function?

Yes - a. What happened?

49. Researchers suggest several physical effects of extended combat on an individual. Based on your experience, how often did the following factors occur in your unit?

a. Fatigue	b. Negative attitudes
c. Appetite loss	d. Sleep loss
e. Depression	f. Alcohol abuse
g. Drug abuse	

50. Did you ever have problems sleeping for any reason?

Yes - What do you feel caused this most often?

51. Were there any discipline problems in the unit?

Yes - a. What kind of discipline problems were they?
b. How were they dealt with?

52. How good was the leadership in your unit?

53. In your experience, you've seen various types of leaders. How would you describe an effective combat leader?

54. Did the antiwar protests and media coverage have any impact on the troops?

55. Is there anything else I ought to be asking people on this subject?

56. Do you know of anyone else I can talk to about Civil Engineering combat experiences in Vietnam?

Appendix B: "After Burner" Advertisement

Retirees who served in Southeast Asia sought for study. Lt Col John Ballard and Capt Jon Wheeler, faculty members at the Air Force Institute of Technology, are studying the combat experiences of Air Force personnel who served in Southeast Asia. Both officers are looking for Air Force personnel who came under fire in Vietnam and who are willing to participate in the study by answering some questions about their experiences. (1) Lt Col Ballard would like to hear from enlisted personnel from any career field. He can be contacted by phone at (513) 255-4529 or Autovon 785-4529, or by mail at AFIT/LSR, Wright-Patterson AFB, OH 45433. (2) Capt Wheeler would like to hear from officers and NCOs who were in civil engineering. He can be contacted by phone at (513) 255-4552 or Autovon 785-4552, or by mail at AFIT/DEE, Wright-patterson AFB, OH 45433.

Appendix C: Data on Participants
Questions 5, 6, 9, 10, 11, 12

		Volun- teer?	Mo/Yr	Main Location	Age	Rank	Job	Type of Unit
1	Phone	Yes	Unk 71	Phu Cat	35	SSgt	Lineman	BCE
2	Phone	Yes	Apr 69	Tuy Hoa	43	Maj	BCE	BCE
3	Phone	No	Nov 67	Tuy Hoa	30	Capt	Design	BCE
4	Phone	No	Nov 68	Pleiku	21	Amn	Equip Opr	BCE
5	Phone	Yes	Jan 69	Da Nang	25	SSgt	Heating Specialist	BCE
6	Personal	No	Oct 67	Bien Hoa	20	1C	Lineman	BCE
7	Personal	Yes	Nov 70	Da Nang	24	1 Lt	Programming	BCE
8	Personal	Yes	Feb 67	Ton Son Nhut	36	TSSgt	NCOIC Hwy Equip	BCE
9	Personal	No	May 70	Cam Ranh Bay	25	SSgt	Liq Fuels	BCE
10	Phone	Yes	Feb 67	Da Nang	34	SSgt	Power Pro	BCE
11	Phone	Yes	Nov 67	Dong Ha	44	SSgt	NCOIC Power Prodtcn	BCE dtch
12	Personal	Yes	Oct 68	Cam Ranh Bay	23	1 Lt	Resident AFRC	BCE/Hq 7AF
13	Personal	No	Sep 65	Ton Son Nhut	35	TSSgt	Plumbing Supervisor	Prime BEEF
13	Personal	Yes	Dec 70	Da Nang	41	MSgt	Convoy Commander	RED HORSE
14	Phone	Yes	Jan 69	Phu Cat	45	MSgt	NCOIC Site Devel	RED HORSE
15	Personal	No	Dec 65	Cam Ranh Bay	32	SSgt	NCOIC Admin	RED HORSE
4	Phone	No	Jul 66	Phu Cat	20	Amn	Equip Opr	RED HORSE
16	Phone	Yes	Jan 68	Phu Cat	26	2 Lt	Design Engineer	RED HORSE
17	Phone	Yes	Jan 68	Binh Tuy	26	SSgt	Plumber	RED HORSE

Notes:

1. Locations listed were those with which respondents most identified with, not necessarily the main base the unit was deployed to. Some RED HORSE respondents were frequently assigned temporarily to other locations during their tour.
2. Respondents 4 and 13 are listed twice because they served two separate tours in Vietnam.
3. Respondent 1 did not recall the month of assignment to Vietnam.

Appendix D: Description of Enemy Attacks

Interview Questions 17, d, e

Type of Unit	Frequency	Length of Attack	Kind of Damage
BCE	All the time.	Very short.	None.
BCE	Once a week.	20 min.	Not much.
BCE	Once in 12 months	Appx 2 hrs	Virtually none. Small arms fire only.
BCE	Countless.	Max 140 mortar rnds.	Extensive (Barracks POL area, supply, aircraft, runway, utilities).
BCE	Every day.	5-30 min.	Lots of dorm and runway damage.
BCE	3.4 times/wk.		A range of facility damage. Lots of spalling.
BCE	1.2 times/mo.	30 min.	Very little.
BCE	Daily.	40 min.	Sometimes very destructive.
BCE	Occasional.	30 min.	Could be destructive (destroyed trucks and buildings).
BCE dtch	1 time/wk.	20 min.	Destroyed trailers.
BCE dtch	Constantly.	All day sometimes	Destroyed buildings.
BCE/Hq 7AF	6 events in 1 1/2 years.	few min.	Minimal damage.
PB/RH	Daily.	few min.	None. Harassing fire.
RED HORSE	Feb 1969, continuous.	10-25 min.	Damage to POL system. Ammo dump, fuel tanks. Some facility damage.

RED HORSE	Very seldom.	few min.	Pings on equipment.
RED HORSE	Very little.	Very short.	Very little. Harassment fire. No actual damage.
RED HORSE	1 time/mo.	10-90 min.	Lucky if fragments hit a vehicle or building.
RED HORSE	1.2 times/wk.	Max 100 mortar rnds.	Holes in buildings. from fragments. runway damage. Blown tires on con- voy.

Appendix E: Return of Hostile Fire
Interview Questions 17b and 17c

Type of Unit	Rank	Comments
BCE	SSgt	Did not personally return fire. Korean Army protected the base. Artillery outfit firing all the time. Our people were firing all the time.
BCE	Maj	Personally returned fire. Korean Army protected the base. Shot back when enemy shot at linemen fixing lights.
BCE	Capt	Did not personally return fire. Security police did return fire.
BCE	Amn	Personally returned fire. Was an SP augmentee.
BCE	SSgt	Did not personally return fire. Were defended by Army, Marines and Security Police.
BCE	A1C	Personally returned fire. Was an SP augmentee.
BCE	1 Lt	No one returned fire.
BCE	TSgt	Personally returned fire. Particularly when performing duties off base.
BCE	SSgt	Did not personally return fire. Security police returned fire.
BCE dtch	SSgt	Did not personally return fire. The only return fire they had was the C-47 gunship.
BCE dtch	SSgt	Did not personally return fire. Army and Marines defended the base.
BCE/Hq 7AF	1 Lt	No one returned fire.
PB/RH	MSgt	No one returned fire in either unit.
RED HORSE	MSgt	No one returned fire. Rules of engagement prohibited.

RED HORSE SSgt No one returned fire. Didn't know what to shoot at.

RED HORSE Amn Personally returned fire while on convoy. ROK troops provided combat patrols of the area.

RED HORSE 2 Lt No one returned fire.

RED HORSE SSgt Personally returned fire while on convoy.

Appendix F: Bonding With the Unit
Interview Questions 28 and 29

Type of Unit	Rank	Unit Cohesion	Close to Unit as a Whole?
BCE	SSgt	Good	No
BCE	Maj	Very Close	Yes. As BCE, felt it was his job to keep morale up.
BCE	Capt	Excellent	Yes. Close to enlisted people. Baseball coach.
BCE	Amn	No unit spirit.	No. Shops more to themselves than in RED HORSE.
BCE	SSgt	Excellent	Yes
BCE	A1C	Tremendous	Yes. Everyone depended on everyone else.
BCE	1 Lt	Very tight.	Yes. Did everything together.
BCE	TSgt	Bad w/ 1st CC. Good w/ 2d CC.	Close to some degree. Not as close as in CONUS.
BCE	SSgt	A pretty tight outfit.	No. Was close with room mates.
BCE dtch	SSgt	Fine.	Yes, good association.
BCE dtch	SSgt	100% cooperatn.	Yes. Everyone was your brother.
BCE/Hq 7AF	1 Lt	Hard to answer.	Felt very comfortable working with BCE forces.
PB/RH	MSgt	Outstanding	Yes.
RED HORSE	MSgt	Wonderful	Yes. Like a family.
RED HORSE	SSgt	Best ever seen.	Yes. Identified 100% with unit.
RED HORSE	Amn	Very well.	Yes. Everyone knew each other's jobs.

RED HORSE 2 Lt Very close Within detachment, yes.
within detach- Within main unit, no.
ment.

RED HORSE SSgt Real Close. 100% behind the commander.

Appendix G: Quality of Unit Leadership
Interview Question 52

Type of Unit	Rank in Vietnam	Unit Leadership	Further Comments
BCE	SSgt	Good and bad.	Some inexperienced Sr NCOs. Crews were training them.
BCE	Maj	Excellent	Including junior officers.
BCE	Capt	Excellent for most part.	One BCE was fired.
BCE	Amn	Fair	Segregation of sleeping arrangements were damaging to unit integrity.
BCE	SSgt	Excellent	Officers were very good.
BCE	A1C	Good as could be expected for the time.	Most officers competent.
BCE	1 Lt	Good overall.	None
BCE	TSgt	Good and bad.	Inexperienced officers didn't ask NCOs for advice. Jr officers didn't have leadership training.
BCE	SSgt	Unimpressive	Some totally wrong decisions made.
BCE dtch	SSgt	Excellent	None
BCE dtch	SSgt	Good and bad.	Combat experienced personnel have different attitudes from those without combat experience.
BCE/Hq 7AF	1 Lt	Very good.	Conscientious understanding of what was going on.

PB/RH	MSgt	Fair	Officers mediocre. Individual groups outstanding.
RED HORSE	MSgt	Outstanding	Most people were hand picked. One pentagon Col wouldn't listen to NCOs.
RED HORSE	SSgt	Fair	Was a "5" on a scale of 1 to 10.
RED HORSE	Amn	Super	None
RED HORSE	2 Lt	With 1st CC, very good in some areas.	One commander fired for lack of common sense.
RED HORSE	SSgt	Beautiful	All levels excellent.

Appendix H: Traits of Effective Combat Leaders
Interview Question 53

Type of Unit	Rank in Vietnam	Traits
BCE	SSgt	Looks out for and knows how to take care of his men.
BCE	Maj	Someone men would follow to ends of earth.
BCE	Capt	Knows what he wants done. Experienced. knows his job. Self confident. Develops his people.
BCE	Amn	Caring, disciplined, tells what is being done and why.
BCE	SSgt	Knows how his people think and what they need to get the job done. Knows what he is talking about. Has a liaison with his people.
BCE	A1C	Calm, cool. Keeps his people informed. Clarifies what he wants. Ensures people understand the objective. Helps his people get to objective.
BCE	1 Lt	Really knows his job. Clarifies what the job is and how it is to be done. Able to delegate.
BCE	TSgt	Backs up those who work for him.
BCE	SSgt	No difference between peacetime and combat leaders. Knows what his people need. Keeps his wits about him. Able to handle lots of information and make logical decisions.
BCE dtch	SSgt	Doesn't press his people too much, but isn't too easy on them either. Keeps his people busy and their minds off things. Knows the area and job to be done.
BCE dtch	SSgt	Leads by example. Knows what he's talking about.

BCE/Hq 7AF 1 Lt Maintains discipline. Sensitive to people. Able to read situation. Knows business well enough to step in and make right decision quickly without all facts. Leads by example.

PB/RH MSgt Knows the mission and hazards.

RED HORSE MSgt Listens to Sr NCOs.

RED HORSE SSgt Human but tough. Enforces rules in a human way.

RED HORSE 2 Lt Extraordinary common sense and adaptability.

RED HORSE SSgt Has the necessary training and self confidence. Has confidence of his people.

Appendix I: Comparison of Unit Cohesion and Leadership
Interview Questions 28 and 52

Type of Unit	Rank	Unit Cohesion	Unit Leadership
BCE	SSgt	Good	Good and bad
BCE	Maj	Very Close	Excellent
BCE	Capt	Excellent	Excellent for most part
BCE	Amn	No unit spirit	Fair
BCE	SSgt	Excellent	Excellent
BCE	A1C	Tremendous	Good as could be expected
BCE	1 Lt	Very tight	Good overall
BCE	TSgt	Bad w/ 1st CC Good w/ 2d CC	Good and bad
BCE	SSgt	A pretty tight outfit.	Unimpressive
BCE dtch	SSgt	Fine	Excellent
BCE dtch	SSgt	100% cooperatn	Good and bad
BCE/Hq 7AF	1 Lt	Hard to answer	Very good
PB/RH	MSgt	Outstanding	Fair
RED HORSE	MSgt	Wonderful	Outstanding
RED HORSE	SSgt	Best ever seen	Fair
RED HORSE	Amn	Very well	Super
RED HORSE	2 Lt	Very close w/in detachment.	Good and bad.
RED HORSE	SSgt	Real Close	Beautiful

**Appendix J: Helpful Factors In The Combat Zone
Interview Questions 24 and 25**

Type of Unit	Rank in Vietnam	Comment
BCE	SSgt	Reading, drinking. USO girls had a negative impact.
BCE	Maj	Knowing his presence was needed there. Support from home. Knowing the best job possible was being done under the conditions.
BCE	Capt	Friends and letters. Having a lot of work to do. Looked forward to the completion of new, air conditioned buildings.
BCE	Amn	Waiting for the end of the tour. Audio tapes, letters, R&Rs. Didn't do a lot except work.
BCE	SSgt	Time went fast, always had something to do. Long, full days. Enjoyed letters from new wife and family. Spent time in clubs, played cards, had barbeques.
BCE	A1C	Continuous work. An awful lot of drinking. Fell back on his religion was very helpful in very stressful situations.
BCE	1 Lt	Lots of work. Never sat around thinking about the combat tour. No time to think about tough times.
BCE	TSgt	He was the boss. Had to act and look good to his people. His religious faith.
BCE	SSgt	Friendships provided a lot of support. Cam Rahn Bay was a garden spot compared to others in Vietnam. Looked forward to going home. Had Sunday off to take care of personal needs and relax.
BCE dtch	SSgt	Kept himself busy. Decided to not think about being there.
BCE dtch	SSgt	18th year of a 20 year career. Kept busy. Looked forward to retirement.

BCE/Hq 7AF 1 Lt Being very busy. Reading, card-playing. On Sundays went to the beach. Knowing that everyone was in the same boat. Had a lot of new experiences.

PB/RH MSgt Being a professional soldier. Had no concerns about his wife and kids. The desire to "get it done" and to watch over his people.

RED HORSE MSgt Work. Letters from home. Realized he couldn't change things - the tough get going.

RED HORSE SSgt End of the tour - light at the end of the tunnel. Thoughts that helped detach him mentally from the situation. Took life one day at a time.

RED HORSE Amn The individuals as a group were helpful. Built some good friendships. Worked and partied as a team.

RED HORSE 2 Lt The challenge of construction, still in build-up phase. Lots of pressure to get things done. Each person picked something to look forward to: R&R, end of tour, etc.

RED HORSE SSgt Religion, prayer helped. Working hard, keeping busy. Partying after job was done. Tried to stay occupied.

Appendix K: Perception of Biggest Problem
Interview Question 15

Type of Unit	Rank in Vietnam	Comment
BCE	SSgt	People not really trained or experienced enough to do the job.
BCE	Maj	Security from incoming fire.
BCE	Capt	Lack of resources (tools, heavy equipment) to do the job.
BCE	Amn	People came in without any training. The RED HORSE team spirit and training were missing.
BCE	SSgt	No combat training. Lack of familiarity with weapons and combat tactics.
BCE	A1C	Obtaining supplies.
BCE	1 Lt	Responding to unknowns and unscheduled activities.
BCE	TSgt	NCOs and officers not knowing what to do.
BCE	SSgt	Specialist mentality toward the mission.
BCE dtch	SSgt	Too many different types of generators. Not enough training to fix all the different types of generators.
BCE dtch	SSgt	Supplies.
BCE/Hq 7AF	1 Lt	Projecting to the next conflict. operating under unanticipated conditions. Working with marginal materials. Operating with degraded equipment. Emotional, physical, mental tiredness.
PB/RH	MSgt	Lack of contingency and construction training. Little experience due to civilian integration.
RED HORSE	MSgt	Getting parts for the motor fleet.

RED HORSE SSgt Security from sniper fire.

RED HORSE Amn Problems identified only with assignment to BCE unit. (See fourth comment, this appendix).

RED HORSE 2 Lt Training. Expects more serious damage in future conflicts in Europe compared with inaccurate VC fire.

RED HORSE SSgt Minimal combat training.

Appendix L: Recommendations for Combat Preparation
Interview Question 16

Type of Unit	Rank in Vietnam	Recommendations
BCE	SSgt	If you're going to issue weapons, teach people how to use them (patrol, convoy, defend self properly).
BCE	Maj	Indoctrinate on what to expect in theater.
BCE	Capt	Ensure there are adequate tools and equipment to meet mission requirements.
BCE	Amn	Train on response to different enemy weapons. Particularly their sounds.
BCE	SSgt	Develop a nucleus of SP-trained CE personnel. Give more defensive training.
BCE	A1C	Need to train people on the modern systems that are being used now. Make Prime BEEF training more realistic. In combat, may have to defend what you construct.
BCE	1 Lt	Need a lot more time on Prime BEEF exercises.
BCE	TSgt	Watching John Wayne films isn't enough. In combat, you need people who know what to expect. Bring guys with combat experience into Prime BEEF training.
BCE	SSgt	Get people to be minimally competent in areas other than their specialty.
BCE dtch	SSgt	Practice job as a group, ensure people can do the job in the field.
BCE dtch	SSgt	Prepared as well as could be.

BCE/Hq 7AF	1 Lt	Put people into unfamiliar circumstances. Emphasize command and control. Build stress, fog into training exercise. Deploy to Europe and evaluate the reception plan.
PB/RH	MSgt	Need professional soldiers for whom the Air Force comes first. More effective training.
RED HORSE	MSgt	Train Prime BEEF away from civilization. Provide inexperienced personnel a briefing on what to expect. Show the younger personnel it's not a game.
RED HORSE	SSgt	Prepare contingency plans before deployment. Train RED HORSE like the Marines.
RED HORSE	Amn	RED HORSE was prepared to do the job.
RED HORSE	2 Lt	Need more realistic training. Need to simulate damage.
RED HORSE	SSgt	Provide Prime BEEF units with Army or Marine Corps basic training. A simulated combat environment (convoy, firefights, area sweep) will save a lot of lives. Observed many think Prime BEEF training is a game.

Appendix M: Desired Training
Interview Questions 37 and 38

Type of Unit	Rank	Comments
BCE	SSgt	Information on what to expect (food, living quarters, everyday life).
BCE	Maj	Indoctrinate on what to expect during the tour.
BCE	Capt	Training in small arms, grenades, mortars. Training in what to do, what to look for.
BCE	Amn	Previous RED HORSE training very helpful. Wanted to be more aware of what was going on around him - country, enemy, weapons.
BCE	SSgt	Indoctrination, perimeter defense. Like what Prime BEEF gets now. An explanation of the effect of enemy weapons. What to do in a rocket attack.
BCE	A1C	Training on the rules of engagement. More training in the M-16, 40 MM, handgrenades. Combat squad tactics.
BCE	1 Lt	None. More training would have generated more anxiety than preparation. Didn't need to know a lot.
BCE	TSgt	No. Training from Korean era was adequate. Felt other guys were untrained for combat.
BCE	SSgt	Any training possible. Thinks current readiness program is good.
BCE dtch	SSgt	First aid.
BCE dtch	SSgt	None.
BCE/Hq 7AF	1 Lt	A prior tour in a BCE unit would have been helpful in learning to do his job.
PB/RH	MSgt	None. Was fully trained by Marine Corps.

RED HORSE MSgt Escape/Evasion. Impress upon people that
CE mission is not a game. Would have
liked to know local nationals were un-
trustworthy.

RED HORSE SSgt Full Marine Corps combat training.

RED HORSE Amn None.

RED HORSE 2 Lt Perimeter defense. Combat tactics.
Training received by Prime BEEF today.

RED HORSE SSgt An Army combat course.

Appendix N: Initial Reaction to Hostile Fire
Interview Question 18

Type of Unit	Rank in Vietnam	Response
BCE	SSgt	Didn't know what was happening.
BCE	Maj	Got out of bed and took cover.
BCE	Capt	Wasn't afraid. Confident attack would be repulsed.
BCE	Amn	Rolled under bed. Didn't know what else to do. Scared to death.
BCE	SSgt	Told to get under rack. Learned real fast.
BCE	A1C	Didn't know what was happening.
BCE	1 Lt	Felt urgency to get to his designated job.
BCE	TSgt	Was concerned about his men.
BCE	SSgt	Didn't know what he was supposed to do.
BCE dtch	SSgt	Didn't know what to do.
BCE dtch	SSgt	Scared, but didn't want to tell anyone about it.
BCE/Hq 7AF	1 Lt	Curiosity to some degree. Stood and watched from safe area.
PB/RH	MSgt	Extremely scared.
RED HORSE	MSgt	Took precautionary measures. Instructed men to do the same.
RED HORSE	SSgt	Total confusion.
RED HORSE	Amn	Took weapons and went to defensive positions.
RED HORSE	2 Lt	Fear. Adrenalin was pumping. Started to anticipate what might happen.
RED HORSE	SSgt	Down right scared.

Appendix O: Training and Perceptions of Preparedness
Interview Questions 3, 35 and 36

Type of Unit	Rank	Pre-Vietnam Training	Feel Prepared For Combat?
BCE	SSgt	Basic	We weren't prepared
BCE	Maj	Navy - WWII	Well prepared. Was in the invasion of D-Day.
BCE	Capt	ROTC/AFIT	Knew wasn't prepared
BCE	Amn	RED HORSE	Not for mortars/rockets
BCE	SSgt	Basic	Only had M-16 training
BCE	A1C	Basic; In-country combat training	Had a refresher in using 40 mm, handgrenades, M-16 expected malfunctions. Wasn't prepared to be a combat soldier.
BCE	1 Lt	ROTC	Not at all
BCE	TSgt	Basic during Korean era	Well prepared
BCE	SSgt	Basic	Ill prepared
BCE dtch	SSgt	Basic	Pretty well prepared
BCE dtch	SSgt	Navy - WWII Survival School at Sheppard AFB	Didn't think too much about it. Believes it's something you never know.
BCE/Hq 7AF	1 Lt	ROTC	Minimal
PB/RH	MSgt	Marine Corps	Ready. Due to Marine Corps training.
RED HORSE	MSgt	Army - WWII	Ready.
RED HORSE	SSgt	Basic	Not at all.
RED HORSE	Amn	RED HORSE	For snipers and ambush
RED HORSE	2 Lt	Basic/OTS	Not at all. Didn't expect combat.
RED HORSE	SSgt	Basic	Didn't

Appendix P: Boredom and Leave

Interview Question 47

Type of Unit	Was boredom a problem?	Take any Leave or R&R?	Was the leave Helpful?
BCE	No	No	
BCE	No	No	
BCE	No	Yes	Wonderful.
BCE	Yes	Yes	Got rid of stress.
BCE	No	No	
BCE	No	Yes	Felt refreshed
BCE	No	Yes	No
BCE	No	No	
BCE	No	Yes	Didn't know. Helped his wife.
BCE dtch	No	Yes	Yes
BCE dtch	No	Yes	Refreshing. Load off shoulders.
BCE/Hq 7AF	No	Yes	Yes. Broke up tour.
PB/RH	Yes	Yes	No. Spent too much money.
RED HORSE	No	No	
RED HORSE	No	Yes	Yes. Opportunity to eat foods not available.
RED HORSE	No	Yes	Helpful just to get out of there.
RED HORSE	No	Yes	Yes. Helpful as a change of pace.
RED HORSE	Yes	No	

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This thesis was an exploratory study designed to identify important aspects of the combat experiences of Air Force Civil Engineering personnel in Vietnam. A lack of previous research on Air Force ground combat experiences required the collection of original data. A 56-question structured questionnaire was used to interview seventeen AFCE Vietnam veterans about their combat experiences. Research results describe the Vietnam combat experience in terms of AFCE leadership, cohesion and combat motivation. Tentative conclusions are offered on the worst problems that were encountered (from a human element standpoint) by AFCE in Vietnam as well as how Civil Engineering personnel could have been better prepared for the combat they experienced. Recommendations are made for further research.

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